

MOTIVATIONAL INTERVIEWING AND THE FAMILY CHECK-UP:  
PREDICTING EMERGING ADULT HEALTH RISK  
BEHAVIOR OUTCOMES

by

ELISA C. DEVARGAS

A DISSERTATION

Presented to the Department of Counseling Psychology and Human Services  
and the Graduate School of the University of Oregon  
in partial fulfillment of the requirements  
for the degree of  
Doctor of Philosophy

June 2018

## DISSERTATION APPROVAL PAGE

Student: Elisa C. DeVargas

Title: Motivational Interviewing and the Family Check-Up: Predicting Emerging Adult Health Risk Behavior Outcomes

This dissertation has been accepted and approved in partial fulfillment of the requirements for the Doctor of Philosophy degree in the Department of Counseling Psychology and Human Services by:

Dr. Elizabeth Stormshak	Chairperson
Dr. Jessica Cronic	Core Member
Dr. Benedict McWhirter	Core Member
Dr. Gina Biancarosa	Institutional Representative

and

Sara D. Hodges	Interim Vice Provost and Dean of the Graduate School
----------------	--

Original approval signatures are on file with the University of Oregon Graduate School.

Degree awarded June 2018

© 2017 Elisa C. DeVargas

## DISSERTATION ABSTRACT

Elisa C. DeVargas

Doctor of Philosophy

Department of Counseling Psychology and Human Services

June 2018

Title: Motivational Interviewing and the Family Check-Up: Predicting Emerging Adult Health Risk Behavior Outcomes

Emerging adulthood is a unique developmental stage during which significant transitions in living environment, social networks, personal responsibilities, and identity development occur. Stress resulting from such transitions relates to increases in health risk behaviors. As such, emerging adults (EAs) have a high prevalence of substance use disorders and sexually transmitted infections. However, EAs are less likely to seek treatment. Therefore, brief methods of intervention, such as Motivational Interviewing (MI) and the Family Check-up (FCU), might be useful approaches for working with this unique population. MI and the FCU are linked with decreases in health risk behaviors. The FCU comprises three sessions: an initial interview, an ecological assessment, and a feedback session. MI techniques are used during the feedback session. Only a few studies have investigated treatment fidelity of the FCU and no studies have examined the use of MI techniques within the FCU. The current study aims to assess treatment fidelity of the FCU, specifically measuring the extent to which therapists adhere to principles of MI during FCU feedback sessions. The current study also aims to determine if a positive relationship exists between therapists' MI-adherence and client change talk (CT), and to determine if MI-

adherence and client CT predict post-intervention health risk behaviors among the 134 EAs who participated in the FCU. Measures of health risk behaviors were collected pre- and post-intervention. MI-adherence was measured with the Motivational Interviewing Treatment Integrity (MITI 4) and client change language was measured using the Client Language Easy Rating Scale (CLEAR) and the Motivational Interviewing Skills Code 2.1 (MISC 2.1) self-exploration code. Four therapists were assessed for treatment fidelity. Results indicate overall fair treatment fidelity. Significant differences between therapists were observed. MI-adherence was positively related to client CT, but not client self-exploration. Several indicators of MI-adherence predicted decreases in EA post-intervention health risk behaviors. Client CT predicted a decrease in EA post-intervention marijuana quantity and client self-exploration predicted increases in marijuana quantity and number of sexual partners. These results have important implications for FCU training and implementation, and indicate that MI-adherence might be a mechanism of change within the FCU intervention.

## CURRICULUM VITAE

NAME OF AUTHOR: Elisa C. DeVargas

### GRADUATE AND UNDERGRADUATE SCHOOLS ATTENDED:

University of Oregon, Eugene  
New Mexico State University, Las Cruces

### DEGREES AWARDED:

Doctor of Philosophy, Counseling Psychology, 2018, University of Oregon  
Master of Science, Counseling Psychology and Human Services, 2015,  
University of Oregon  
Bachelor of Arts, Psychology, 2010, New Mexico State University  
Bachelor of Arts, Foreign Languages, 2010, New Mexico State University

### AREAS OF SPECIAL INTEREST:

Child and Adolescent Development  
Substance Use Prevention  
Parenting  
Latino/a Mental Health  
Spanish Language Psychological Service and Research

### PROFESSIONAL EXPERIENCE:

Qualified Mental Health Provider, Centro Latinoamericano, 2016 – 2017

Psychology Practicum Intern, Children's Farm Home, Trillium Family Services  
Corvallis, 2015 – 2016

Child and Family Practicum, Child and Family Center (CFC), 2015 – 2016

Research Assistant, Prevention Science Institute, 2013 – 2016

Psychology Assessment Intern, Child Development and Rehabilitation Center,  
Oregon Health and Science University, 2015

Bilingual Therapy Intern, Volunteers in Medicine Clinic (VIM), 2015

Bilingual Community Support Worker & Therapy Intern, Agave Health, Inc.,  
2014

Spanish Speaking Interventionist, Prevention Science Institute, 2014

Adult Practicum Intern, University Counseling and Testing Center,  
University of Oregon, 2013 – 2014

MHIRT Trainee, Latino Mental Health Research Training Program,  
2013

Observational Data Coder, University of Oregon, 2012

Interventionist, The Mind Research Network, 2010 – 2012

Research Associate II, The Mind Research Network, 2010-2012

#### GRANTS, AWARDS, AND HONORS:

College of Education Alumni Scholarship, University of Oregon College of  
Education Scholarship, 2016-2017

Lorraine Moe Davis Scholarship, University of Oregon College of Education  
Scholarship, 2016-2017

Betty Foster McCue Fellowship for Human Performance and Development,  
University of Oregon Graduate School Dissertation Award, 2016-2017

College of Education Alumni Award, University of Oregon College of Education  
Dissertation Award, 2016

NLPA Latino/a Child, Adolescent & Family Psychology Special Interest Group,  
National Latino/a Psychological Association 2014 Biennial Convention,  
2014

NIH/NICHD Ethnic Minority Supplemental Grant, Project Alliance 2, University  
of Oregon, Prevention Science Institute, 2013-2016

Amelia and Albert Lee Deferris Scholarship, University of Oregon College of  
Education Scholarship, 2013-2014

NIH/NIMH Minority Health and Health Disparities International Research  
Training (MHIRT), University of Southern California & El Instituto  
Nacional de Psiquiatria, 2013

PUBLICATIONS:

Salvador, J. G., **DeVargas, E. C.**, Feldstein Ewing, S. W. (2015). Who are Hispanic youth? Considerations for adolescent addiction, clinical research, and treatment. *Alcohol Treatment Quarterly*, 33(3), 348-362.

Stormshak, E. A., **DeVargas, E. C.**, Cardenas, L. (In Press). Family factors: Parenting practices. In J.E. Lochman & W. Matthys (Eds.), *The Wiley Handbook of Disruptive and Impulse-Control Disorders* (pages unknown).

Chain, J., Bartholomew, T., **DeVargas, E.**, Knettel, B., Liu, C., Pendse, A., Sahai, N., & Shaykis, S. (Winter 2015). International Section Student Forum: Research or Clinical Work Abroad. *International Section Newsletter*. 16-20.

<http://www.div17.org/wp-content/uploads/International-Section-Winter-2015-Newsletter.pdf>



## ACKNOWLEDGMENTS

I wish to express sincere appreciation to my advisor Beth Stormshak and dissertation committee members Jessica Cronce, PhD, Benedict McWhirter, PhD, and Gina Biancarosa, PhD, for their assistance in the preparation of this manuscript. I would also like to extend special thanks to Caroline Shanley, whose familiarity with statistical analysis was helpful during the final stages of this undertaking. In addition, I would like to express my gratitude to Denise Ernst, PhD, whose Motivational Interviewing fidelity expertise was extremely helpful during the early stages of training and data collection. Furthermore, the completion of this project would not have been possible without the help of my coding team: Danielle Wilson, Hayden Spence, Danielle Schaer, Faith Trewhella, and Stephanie Johnston. Last, but not least, I would like to extend sincere appreciation for my family, friends, and colleagues who offered me support throughout the process of completing this manuscript and doctoral degree. Thank you to my parents, Maria Varela and Antonio DeVargas, for teaching me to value education and to persevere through the most difficult of circumstances. Also, I would like to send a special thanks to my partner, Erick James, for sticking with me through the last four years and motivating me with hope and determination.

This research was funded with grants from the National Institute on Drug Abuse (DA: 8472628) and National Institute of Child Health and Human Development (HD: 8014702) to Elizabeth Stormshak. This work was also funded by a minority supplemental grant from NICHD (HD: 8014684) and by the Betty Foster McCue and University of Oregon College of Education Alumni Awards.

This dissertation is dedicated to my mother.  
In loving memory of Maria Varela (November 13, 1955 – September 23, 2014).  
I love you mommy and wish you could have been here to see me graduate!

## TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION .....	1
Motivational Interviewing .....	5
Treatment Fidelity.....	9
Family Check-Up.....	12
Current Study .....	15
Research Question 1 .....	16
Research Question 2 .....	16
Research Question 3 .....	17
II. METHODS.....	19
Sample.....	19
Feedback Session Recording and Coding.....	20
FCU Therapists .....	20
Procedure .....	21
Measures .....	22
Substance Use .....	22
Alcohol Use .....	22
Marijuana Use.....	23
Sexual Behavior .....	24
Overall Risk .....	25
Therapist Adherence to MI.....	26

Chapter	Page
Client Change Language.....	27
Training of Coders .....	28
Training of Therapists .....	31
Analytic Strategy .....	32
Recoding Variables to Account for Skip Patterns .....	32
Research Question 1 .....	32
Research Question 2 .....	33
Research Question 3 .....	33
Power Analysis .....	35
Missing Data .....	36
III. RESULTS .....	37
Therapist Treatment Fidelity.....	37
Relationship Between Therapist MI-Adherence and Client Change Language ....	39
Summary .....	40
Predictions of EA Post-Intervention Health Risk Behaviors.....	40
Alcohol Use .....	41
Marijuana Use.....	41
Sexual Behavior .....	43
Summary .....	44
Predictions of EA Post-Intervention Overall Risk.....	44
IV. DISCUSSION.....	46
Treatment Fidelity.....	47

Chapter	Page
MI and Client Change Language .....	50
Predicting EA Post-Intervention Health Risk Behaviors.....	52
Initial Risk.....	52
MI-Adherence.....	53
Client Change Language.....	55
Predicting Overall Risk.....	56
Initial Risk.....	57
MI-Adherence .....	57
Client Change Language.....	58
Implications.....	59
Limitations and Future Directions .....	60
Conclusions.....	63
APPENDICES .....	82
A. COACH.....	82
B. MITI 4 CODING MANUAL .....	83
C. MISC 2.1 GLOBAL.....	124
D. CLEAR CODING MANUAL .....	126
REFERENCES CITED.....	143

## LIST OF FIGURES

Figure	Page
1. Conceptual Model Depicting Relation Between IVs and DVs.....	65
2. Group and Individual Therapist Means for the MITI 4 Technical Score. ....	72
3. Group and Individual Therapist Means for the MITI 4 Relational Score.....	73
4. Group and Individual Therapist Means for the MITI 4 Ratio of Reflections to Questions Score .....	74
5. Group and Individual Therapist Means for the MITI 4 MI-Adherent and MI Non-Adherent Score .....	75
6. Between Therapist Comparisons of MITI 4 Global Summary Scores .....	76
7. Between Therapist Comparisons of MITI 4 Ratio of Reflections to Questions Scores .....	77
8. Between Therapist Comparisons of MITI 4 MI-Adherent and MI Non-Adherent Scores .....	78

## LIST OF TABLES

Table	Page
1. Summary of Independent and Dependent Variables .....	66
2. MITI 4 Clinician Basic Competency and Proficiency Thresholds .....	70
3. Intraclass Correlation Results .....	71
4. Therapist MI-Adherence and Client Change Language Correlations.....	79
5. Poisson and Negative Binomial Regression Results .....	80
6. Ordinal Regression Results .....	81

## **CHAPTER I**

### **INTRODUCTION**

In the United States and in other industrialized countries, the transition to adulthood has become a longer process in which more young people are extending educational and training endeavors and delaying marriage, parenthood, and the start of a career (Arnett, 2005). Due to these shifts in normative attainment of adult responsibilities, Arnett (2000) introduced the term “emerging adulthood” as the developmental period between adolescence and adulthood that spans ages 18-25 years. Emerging adulthood is characterized by unique tasks and expectations including changes in autonomy, residence, identity, social roles, and career pursuits (Arnett, 2007). Each of these characteristics help emerging adults (EA) develop important qualities for becoming self-sufficient, a key criterion for transitioning to adulthood (Arnett, 1998). Therefore, the late teens and early 20s is a period of self-exploration and identity formation marked by frequent changes in living situation, social networks, and personal responsibilities (Arnett, 2005). Some even believe that this developmental stage is the most unstable period of one’s life (Arnett, 2005). As such, some of the stressors associated with this transitional stage of life can lead to engagement in health risk behaviors and challenges in interpersonal relationships. For example, the instability experienced by EAs is related to an increase in substance use, casual sexual encounters (sexual intercourse with someone not considered a romantic partner), emotional difficulties, and poorer relationships with parents (Arnett, 2005; Grello, Welsh, & Harper, 2006; Schulenberg, Bryan, & O’Malley, 2004). It is of particular importance and relevance to the current study to understand the



difficulties faced by EAs as we explore mechanisms of change and strategies of intervention aimed at reducing health risk behaviors within this age group.

Many of the challenges experienced by EAs are interrelated. Poor relationships with parents and parental permissibility of alcohol use are predictive of greater alcohol and drug use among EAs (Abar, Abar, & Turrisi, 2009; Abar, Turrisi, & Mallett, 2014; Huh, Huang, Liao, Pentz, & Chou, 2013). Decreased parental monitoring, living away from home, and increased reliance on peer relationships are linked with increases in health risk behaviors among people in their early 20s (Borsari & Carey, 2001; White et al., 2006). Use of marijuana and tobacco among EAs is more likely to occur in combination with alcohol use (Cohn, Johnson, Rath, & Villanti, 2016), and some researchers believe that alcohol use is the catalyst for later substance use (Barry et al., 2016). Moreover, risky sexual behavior, such as sexual intercourse without a condom is more likely to occur when EAs are drinking alcohol (Grello et al., 2016). Likewise, risky sexual behavior is linked to mental and physical health concerns (Bowers, Segrin, & Joyce, 2016; Grello et al., 2006). Due to the relationship between such challenges and behaviors, interventions that effectively support positive changes in one domain could potentially influence changes in other areas of EAs' lives as well.

Providing effective interventions during emerging adulthood could also prove to be crucial in preventing the continuation of health risk behaviors into later adulthood. This is especially important to consider given that EAs are at greater risk of meeting criteria for an alcohol or substance use disorder than older and younger age groups (Wu, Pilowsky, Schlenger, & Hasin, 2007), and have the highest age-specific prevalence of sexually transmitted diseases (STDs: Center for Disease Control, 2015). Thirty-five

percent of college students report binge drinking on a regular basis (Miech, Johnston, & O'Malley, 2015); 31% meet criteria for alcohol use disorders, and 6% meet criteria for alcohol dependence (Knight et al., 2002). Additionally, marijuana use significantly increases from adolescence through emerging adulthood, with 40% of youth reporting marijuana use prior to college and 60% reporting marijuana use by sophomore year of college (Skidmore, Kaufman, & Crowell, 2016). Among 18 to 25-year-olds, including non-college attending EAs, the 30-day prevalence rate of marijuana use was 18.7% in 2012 (Andrews & Westling, 2016). According to a study by Stinson et al. (2006), the average age of onset of cannabis use disorder (CUD) is 19, with age of onset after age 30 being extremely rare. Additionally, prevalence rates of STI's in 2008 demonstrated that approximately 20% of STIs and 50% of incident infections (first positive test result) occurred among men and women between the ages of 15-24 years (Satterwhite et al., 2013). Furthermore, in a study of over 30,000 college students, only 38.2% of sexually active participants used a condom during the last incidence of intercourse (American College Health Association, 2009). Although many researchers attribute spikes in health risk behaviors to the college experience, increases in substance use and other health risk behaviors have been found among EAs regardless of whether they went on to attend college (White et al., 2005).

Despite such high prevalence rates for health risk behaviors among EAs, very few receive treatment. In a study by Wu et al. (2007), only 4% of college students with an alcohol use disorder received any alcohol treatment services within the past year, and an even smaller percentage of EAs with an alcohol use disorder reported a perceived need for alcohol treatment. Additionally, prevalence rates of STIs among EAs are believed to

be underestimated, because many STIs are unreported, and therefore go untreated (Satterwhite et al., 2013). Findings such as those reported above highlight the importance of interventions that are tailored to meet the needs of EAs and that are effective, engaging, and target multiple health risk behaviors. Many treatment options prescribe sustained engagement over a period of months (Lowry & Ross, 1997). Such treatments are not ideal for EAs, given the lack of stability experienced by this population. Additionally, aside from colleges and universities, there are few contexts in which interventions can be embedded to make treatment more accessible to EAs, posing a major problem for those within this age group who do not attend college (Skehan & Davis, 2017). Therefore, brief models of intervention serve as great alternatives for targeting this age group.

Brief intervention models have widespread evidence supporting their lasting impact on health risk behaviors with as little as 2-3 sessions (Miller & Sanchez, 1994). Additionally, brief interventions are effective at decreasing treatment attrition and increasing treatment engagement (Mistler, Sheidow, & Davis, 2015). Among EAs, participation in 2-3 sessions might seem more manageable and might be a better fit for the lifestyle of those who are experiencing significant stressors related to transitional life events. Interventions such as the Family Check-Up (FCU) and Motivational Interviewing (MI) have documented evidence of their efficacy at preventing and reducing health risk behaviors among both adolescent and EA samples, and both have been designed for use as brief treatment models (Branscum & Sharma, 2010; Caruther, Van Ryzin, & Dishion, 2014; Cushing, Jensen, Miller, & Leffingwell, 2014; Fosco, Frank, Stormshak, & Dishion, 2013). Additionally, brief interventions, such as MI and the FCU, offer the

flexibility and cost effectiveness necessary for implementing such interventions across a variety of settings, including in homes and medical centers (e.g., Smith, Schetzina, Polaha, Baker, & Wood, 2016).

### **Motivational Interviewing (MI)**

MI is a person-centered counseling technique that addresses ambivalence about change, and has been linked to decreases in problem drinking and other health risk behaviors among both adolescents and EAs (D’Amico et al., 2015; Sussman, Sun, Rohrbach, & Spruijit-Metz, 2012). MI can be used as a stand-alone intervention or in conjunction with other counseling theories and models. For example, MI is often used as a brief pre-treatment tool to enhance treatment engagement in such interventions as Cognitive-Behavioral Therapy (Moyers & Houck, 2011). MI comprises a set of therapeutic techniques that are utilized in a manner that elicits and attends to client language about change (Miller & Rollnick, 2013). Therapeutic techniques drawn from MI, such as open-ended questions, affirmations, reflections, and summaries (OARS) are significantly more likely to elicit and be followed by change talk (CT), client language that argues in favor of change (Apodaca et al., 2015; Miller & Rollnick, 2013). The FRAMES (*Feedback, Responsibility, Advice, Menu of Options, Empathy, and Self-efficacy*) model, which is utilized in the FCU intervention, includes the use of OARS as a means of communicating with clients and responding to CT in an empathic, client-centered manner that reflects “MI-spirit” (Miller & Rollnick, 2013; Miller & Sanchez, 1994). MI-spirit is composed of four elements: partnership, acceptance, evocation, and compassion (Miller & Rollnick, 2013). Each of the aforementioned four elements has both an experiential and behavioral component (Miller & Rollnick, 2013). Partnership is

an active collaboration through which both client and therapist are viewed as experts and is behaviorally enacted via therapists' use of verbal emphasis on client autonomy and expertise (Miller & Rollnick, 2013). Relatedly, acceptance refers to the act of valuing the contributions of each person from a non-judgmental standpoint (Miller & Rollnick, 2013). Acceptance also encompasses empathy (active interest in the other's perspective), autonomy support (honoring each person's right for self-direction) and affirmation (acknowledgement of the person's strengths). Evocation comes from the premise that clients' already have what is needed for change and the therapist's task is to evoke CT about a target behavior using the OARS techniques (Miller & Rollnick, 2013).

Compassion refers to the act of valuing and seeking the well-being of others rather than pursuing self-interest and is behaviorally enacted through therapists' attention to clients' readiness to change (Miller & Rollnick, 2013). According to Miller and Rollnick (2013), MI encompasses an integrated set of interviewing skills that are implemented in sessions with clients, and that are done in a manner that is consistent with MI-spirit. Therefore, it is critical to understand MI-spirit, the client-centered OARS skills, the response to and evocation of CT, and the importance of strengthening self-efficacy in order for MI to be used successfully as an intervention.

Overall, the effects of MI interventions on a number of health risk behaviors have been positive. Over the last decade, several meta-analytic reviews have supported evidence of MI's efficacy at changing health risk behaviors such as substance use, HIV-related behaviors, sexual practices, exercise, diet, and treatment adherence for individuals with medical conditions such as diabetes and heart disease (Copeland, McNamara, Keslon, & Simpson, 2015; Cushing et al., 2014; Hettema, Steele, & Miller, 2005;

Lundhal et al., 2013). In a review of MI-based interventions targeting problem drinking among college students, MI consistently related to reductions in alcohol use and drinking problems (Branscum & Sharma, 2010). Moreover, in a randomized-controlled trial (RCT) examining the effects of MI on alcohol and drug use among adults being treated for depression, MI was more effective than the control at reducing cannabis use and binge drinking, and participation in MI was predictive of lower cannabis use 6-months post-treatment (Satre et al., 2016). Among individuals with multiple sexual partners who participated in a pilot RCT, a significant decrease in unprotected sexual intercourse events was observed for those assigned to the group-based MI intervention, but not for those who were in the control group (Tucker, D'Amico, Ewing, Miles, & Pederson, 2017). Tucker et al. (2017) also found a significant increase in condom use self-efficacy among participants in the MI intervention group as compared to those in the control group.

Although MI interventions as a whole are related to significant changes in health risk behaviors, research has increasingly focused on identifying the mechanisms by which MI works to promote positive behavioral changes. Client language about change has been a particular domain of investigation for such researchers (e.g., Houck & Moyers, 2015). As previously noted, client CT is self-expressed language in favor of changing a target behavior (Miller & Rollnick, 2013), and is theorized to be a causal mechanism for later changes in behavior (Moyers & Martin, 2006; Moyers, Martin, Houck, Christopher, & Tonigan, 2009). In a meta-analysis of the causal components of MI, Magill et al. (2014) found that CT mediated the relationship between therapist behaviors and treatment outcomes. Client speech is influenced by MI therapists (Moyers

& Martin, 2006), and studies investigating clinician training have found that specialized MI training can increase client CT (Miller et al., 2004). Therefore, researchers hypothesize that therapists trained to attend to and evoke CT will produce more CT, and thus see greater changes in substance use outcomes over time (Moyers et al., 2009).

Adherence to MI principles significantly contributes to the impact of the therapists' verbal responses on client overall change. In a study by Moyers and Martin (2006), MI-adherent (MIA) therapist behaviors were more likely to be followed by CT, in the form of self-motivated statements, whereas MI non-adherent (MINA) therapist behaviors led to more client resistance. The relationship between client and therapist speech is bidirectional, where greater therapist MIA relates to more CT and vice versa (Barnett, Spruijt-Metz, et al., 2014). Client CT also mediates the relationships between MI quality indicators (i.e., OARS skills) and substance use outcomes (Barnett, Moyers, et al., 2014). In addition, CT predicts positive therapist reflections, and sustain talk (ST), client speech in favor of the status quo, predicts negative therapist reflections (Miller & Rollnick, 2013). Likewise, therapist reflections are predictive of client speech, both CT and ST (Barnett et al., 2014). Therefore, clinicians might influence real-world client behaviors that lead to more positive outcomes, specifically when clinicians are successfully able to evoke and strengthen CT. Due to supporting evidence of CT as an active ingredient of MI and evidence of the predictive relationship of therapist behaviors on client language, the importance of evaluating therapists' MIA is repeatedly stressed by MI researchers (e.g., Moyers, Martin, Manuel, Hendrickson, & Miller, 2005). Highlighting the need for evaluation of therapist MIA, researchers who conducted a RCT of MI compared with a drug information and advice condition found low levels of MI

fidelity among therapists and hypothesized that non-significant differences between treatment and control were related to therapists' lack of fidelity to the MI treatment model (McCambridge, Slym, & Strang, 2008). For this reason, various tools for measuring treatment fidelity have been developed for the assessment of therapists' MI skills and techniques (Dobber et al., 2015).

**Treatment Fidelity.** Treatment fidelity (also known as treatment integrity) is defined as the extent to which an intervention is implemented the way it was intended (Perplechikova, Treat, & Kazdin, 2007) and comprises: (a) the degree to which therapists adhere to the recommended procedures of the intervention and avoid procedures that are proscribed; and (b) the level of skill/competence demonstrated by the therapist in their implementation of the prescribed procedures (Waltz, Addis, Koerner, & Jacobson, 1993). Tests of treatment fidelity allow for client outcomes to be differentially attributed to the intervention in question, provide information about how interventions are implemented across different sites and therapists, and can inform the training of therapists to maximize adherence and competence (Waltz et al., 1993). Adherence refers to the degree to which therapists use approaches that are prescribed by the treatment model, and competence refers to the skill-level of therapists when implementing the treatment model (Waltz et al., 1993).

The development and selection of MI treatment fidelity measures should encompass ways of assessing both adherence and competence. To date, the most widely used tool to evaluate MI fidelity is the Motivational Interviewing Treatment Integrity coding system (MITI; Moyers, Martin, Manuel, Hendrickson, & Miller, 2005). There are several advantages to using the MITI as a fidelity instrument. For one, the MITI provides



greater accuracy of measuring specific in-session therapist behaviors through frequency counts of behaviors such as reflections and affirmations (Moyers, Rowell, Manuel, Ernst, & Houck, 2016). Another advantage is the measurement of therapists' illustration of empathy, a key element of MI-spirit and a core component of other psychological interventions, which has been linked with positive client outcomes (Moyers et al., 2016). In several research settings, the MITI has also demonstrated good psychometric properties (e.g., Seng & Lovejoy, 2013), and interrater reliability (IRR) is relatively easy to establish among individuals with no prior clinical or MI training (Moyers et al., 2016). Further, the most recent iteration of the MITI (MITI 4; Moyers, et al., 2016) has new global ratings of technical elements of MI that take into account therapists' skill in evoking CT and reducing ST. Evocation, as aforementioned, is a key element of MI-spirit and a quality of MI that distinguishes it from other types of interventions (Miller & Rollnick, 2013); thus, incorporating an evaluation of therapists' technical skills (i.e., attention to and strengthening of CT) is a significant improvement of the MITI 4. Notable in this description of the MITI's advantages is its ability to evaluate therapist adherence and competence through specific behavior counts and overall global impressions.

The Motivational Interviewing Skills Code (MISC; Miller, Moyers, Ernst, & Amrhein, 2008) is another widely used instrument for measuring MI fidelity. In a review of fidelity measures that best capture the active ingredients of MI, the most recent iteration of the MISC (version 2.1) was found to have high reliability and validity (Dobber et al., 2015). Specifically, Dobber and colleagues (2015) reported that the MISC 2.1's global ratings, measures of technical skills, and behavior counts of both therapist and client behaviors are superior to other measures of fidelity because it captures detailed

information and accounts for components of the interventions that have been proposed as mechanisms of change (i.e., evocation, OARS, and client CT and ST). Drawbacks that were noted by Dobber et al. (2015) were the coder training time and duration of time it takes to code videos with the MISC 2.1, which are important considerations given the funding and time limitations that many studies face. As such, recommendations were made to use a combination of instruments when investigating MI treatment fidelity, while giving particular attention to instruments' ability to collect detailed information about therapist adherence, competence, and mechanisms of change when making decisions about which instruments to use (Dobber et al., 2015).

Studies that have used the MISC and MITI to measure therapist MI fidelity have demonstrated fair to good IRR as determined by intraclass correlation coefficients of .40-.80 (e.g., D'Amico et al., 2015; Dunn et al., 2016). Additionally, studies that used these two measures of fidelity report that higher levels of MI treatment fidelity are related to better overall client outcomes (Gaume, Gmel, Faouzi, & Daeppen, 2009) and the use of MI skills and techniques relates to higher levels of CT during MI sessions (D'Amico et al., 2015). Study findings also suggest that merely avoiding MINA behaviors might be more influential to behavior change than the frequency with which MIA skills are used (Gaume et al., 2009), specifically because MINA behaviors are more likely to be followed by ST or neutral client language than MIA behaviors (Gaume, Bertholet, Faouzi, Gmel, & Daeppen, 2010). Furthermore, in a recent study in which providers were randomly assigned to two MI training conditions (both groups participated in a 1-day MI training, and one group was randomized to receive 6 months of follow-up feedback and coaching), researchers found that provider treatment fidelity significantly increased when

providers received targeted MI training and coaching in comparison to those who only received the 1-day training (Darnell, Dunn, Atkins, Ingraham, & Zatzick, 2016). Given the knowledge we have about the active ingredients of MI, the unique qualities of the intervention, such as attending to and strengthening CT, and evidence of the benefits of quality training to fidelity, recommendations have been made for using the MITI as a structuring tool in clinical supervision for coaching therapists on best practices related to MI (Moyers et al., 2016). Ongoing monitoring of treatment fidelity reduces drift from prescribed procedures and affects the potential benefits clients will experience as a result of the intervention.

### **Family Check-Up (FCU)**

The FCU is a brief family-centered intervention shown to be efficacious in preventing and reducing substance use and other problem behaviors in children, adolescents, and EAs (Caruther et al., 2014; Fosco et al., 2013). The FCU is adapted from the Drinker's Check-Up (Miller, Sovereign, & Krege, 1988), a brief assessment-driven, motivational enhancement intervention (MI + feedback from normative-based assessments) for problem drinkers. Thus, the FCU has a framework based upon principles of MI that include the primary goals of increasing self-efficacy and motivation for change (Miller & Rollnick, 2002). The FCU is an ecological approach aimed at improving youth's emotional, social, and behavioral adjustment across settings (i.e., home, school/work, community), and is composed of three sessions: an initial interview (intake), a family observation assessment, and a feedback session (Dishion & Stormshak, 2007). The feedback provided to youth and families is based on age-related norms and is a strengths-based procedure aimed at collaboratively helping youth and families

understand the ecological factors that contribute to challenges they are experiencing (Smith et al., 2013a). According to Dishion and Stormshak (2007), a primary goal of the FCU feedback session is to increase motivation to change using techniques drawn from MI, such as promoting CT and specifically focusing on the FRAMES model for brief therapy (Miller & Sanchez, 1994). According to Miller and Sanchez (1994), brief therapy models that include personalized *feedback* regarding risk status, emphasize the individual's personal *responsibility* for change, give brief and direct *advice* about change, provide a *menu* of alternative strategies, demonstrate therapist *empathy*, and promote *self-efficacy* have yielded large effects on substance use outcomes. Research investigating the efficacy of the FCU indicates that participation in the intervention predicts a decrease in problem behaviors among preschool children (Dishion et al., 2008), and a reduced risk for antisocial behaviors, involvement with deviant peers, and decreased substance use among adolescents (Fosco et al., 2013). Findings suggest that effects on child and youth behaviors are mediated by improvements in parenting strategies and an increase in youth effortful control (Dishion et al., 2008; Stormshak, Fosco, & Dishion, 2010). Recently, research has begun to explore how the FCU influences behaviors in emerging adulthood. For example, in a recent study, researchers found that participating in the FCU improved EA well-being in the following domains: vocational, socioemotional, sexual behavior, and alcohol, marijuana, and illicit drug use risk (Stormshak, DeGarmo, Chronister, & Caruther, in preparation). Findings from Stormshak et al. (in preparation) also supported previous FCU research suggesting that increases in effortful control and self-regulation are related to decreased engagement in risk behaviors.

Despite research supporting the FCU's efficacy, very little is known about mechanisms of change of this intervention and few studies have investigated how treatment fidelity influences the effects experienced by clients (Smith et al., 2013a; Smith, Dishion, Moore, Shaw, & Wilson, 2013b; Chiapa et al., 2015). Additionally, research on FCU treatment fidelity has primarily focused on how the therapist gives personalized feedback rather than how core elements of MI, such as empathy, partnership and evocation of CT, are utilized to promote change in behaviors (Smith et al., 2013a; Smith et al., 2013b). For example, in a study by Smith et al. (2013a), researchers used the COACH rating system to quantify the extent to which therapists exhibited fidelity to the core components of the FCU intervention. The COACH assesses five dimensions of therapist skill and an assessment of client engagement in the session (Smith et al., 2013a). The five dimensions of the COACH represent the therapist's *conceptual* accuracy of the FCU implementation, *observant* and responsive approach to clients' context and needs, *active* structuring of sessions to optimize effectiveness, *careful* approach to teaching and providing feedback, and promotion of *hope* and motivation (Smith et al., 2013a). However, only one dimension of the COACH (hope and motivation) examines the use of MI and this dimension does not track the use of key techniques, such as reflections. COACH ratings of fidelity are indicated on a 9-point scale (1-3 = *needs work*, 4-6 = *acceptable work*, 7-9 = *good work*), with a score of 5 indicating sufficient fidelity to the FCU model (Smith et al., 2013a). Please refer to appendix A for a copy of the COACH rating form. Overall, Smith et al. (2013a) found that therapists' mean fidelity scores were within the "good work" range and slightly above the minimum competency cutoff. Therapist fidelity scores were significantly related to parent engagement scores in the

feedback session, and parent engagement mediated the effects of treatment fidelity on observed parenting skills 1 year post-intervention (child age 3). Smith and colleagues (2013a) also found that parenting skills 1 year post-intervention (age 3) were negatively related to reported child problem behaviors at age 4. In another study on FCU fidelity (Smith et al., 2013b), researchers found that video feedback predicted improvements in family functioning above and beyond caregiver engagement. Specifically, the use of video feedback was related to reductions in parents' negative schemas of the child 1 year after intervention, which had a mediating effect on later coercive parent-child interactions 3 years after intervention (Smith et al., 2013b). FCU fidelity research also supports the need for continuous monitoring of therapist fidelity over time. In a study by Chiapa et al. (2015), latent growth modeling was used to map trajectories of therapist fidelity over a span of 4 years. Significant declines in therapist fidelity were observed over time and were related to less improvements in family functioning (Chiapa et al., 2015). Similar to Smith et al. (2013a; 2013b), Chiapa and colleagues (2015) used a composite COACH score to represent FCU fidelity and did not measure the impact of specific therapist behaviors (e.g., empathy, reflections, attention to CT) on client outcomes.

### **Current Study**

Research on FCU treatment fidelity has not specifically investigated how the use of MI techniques within the FCU feedback session contributes to adolescent and EA health risk behavior outcomes (e.g., Smith et al., 2013a). The current study aims to address this gap in the literature by evaluating the extent to which FCU therapists adhere to MI for reducing health risk behaviors among EAs during the FCU feedback session. The current study also seeks to determine whether there is a relationship between use of

MI and client change language during the FCU feedback session. Moreover, the study aims to investigate whether therapist MI-adherence and client change language in the FCU feedback sessions are related to reductions in health risk behaviors among EAs. The current study utilized a sample of EAs who participated in the FCU between 2013 and 2015 (Project Alliance 2[PAL2]; HD 075150). First, we coded feedback session videos from 134 client-therapist meetings that utilized the FCU. These were coded with the MITI 4 for MI therapist behaviors and techniques. Feedback session were also coded for client change language with the MISC 2.1 global rating of client self-exploration and the Client Language Easy Rating scale (CLEAR; Glynn & Moyers, 2012), formerly known as the MISC 1.1, for frequency of CT and ST. Survey data were collected from EAs prior to their participation in the FCU and again 1 year post-intervention to measure health risk behaviors. The following research questions (RQ) are addressed in order to achieve the current study aims:

**RQ 1.** The first research question was focused on examining treatment fidelity by coding the video observations and comparing therapists on their use of MI strategies during the FCU feedback sessions. Previous research has demonstrated that MI providers who have previous counseling training tend to have higher MI fidelity scores than providers who have no clinical background (Darnell et al., 2016). The therapists in the current study are all doctoral level psychologists; therefore, the author hypothesized that therapists would evidence at least minimum level competency (i.e., “fair” benchmarks) in terms of MI fidelity as measured by MITI 4 summary scores.

**RQ 2.** The second research question was focused on examining the relationship between therapist MI fidelity and client change language as measured by the MISC 2.1

and CLEAR during the FCU feedback sessions. Higher levels of MI-adherence are hypothesized to relate to a higher frequency of client CT and higher levels of self-exploration during the FCU feedback sessions. This hypothesis is based on research suggesting that MI-adherence is bidirectionally related to client change language (Barnett, Spruijt-Mertz, et al., 2014),

**RQ 3.** The third research question focused on examining the relations among MI-adherence and client change language as predictors of EA health risk behaviors 1 year post-intervention. Specifically, there were two main outcomes that were predicted: *counts of health risk behaviors* (RQ 3a), and *overall risk* (RQ 3b). Higher levels of MI-adherence, frequency of CT, and client self-exploration were expected to predict decreases in EA health risk behaviors 1 year post intervention as measured by count variables representing alcohol and marijuana use frequency and quantity over the past 3 months, number of sexual partners over the past 3 months, and condom use frequency over the past 3 months. Lastly, it is hypothesized that higher levels of MI-adherence, CT, and self-exploration will predict lower overall risk 1 year post-intervention. Overall risk will be measured using an ordinal variable representing participant engagement in health risk behaviors (i.e., binge drinking, high frequency marijuana use, and multiple sex partners) with the following variables: zero risk behaviors; engagement in one risk behavior; engagement in two risk behaviors; and engagement in three risk behaviors. These hypotheses are supported by research suggesting that MI-adherence and FCU fidelity relate to more positive substance use and health risk outcomes (Chiapa et al., 2015; Moyers & Martin, 2006), and that CT is one of the causal mechanism through



which MI influences behavior change (Moyers & Martin, 2006; Moyers et al., 2009; Smith et al., 2013a). See Figure 1 for a conceptual model of these relationships.

## CHAPTER II

### METHODS

#### Sample

EAs who participated in this study comprised a subsample ( $n = 134$ ) of a larger RCT ( $N = 593$ ; [PAL2]; HD 075150) aimed at examining the efficacy of a school-based, family-centered substance use prevention intervention delivered during middle school (6<sup>th</sup> grade) and again during emerging adulthood (ages 17-21 years). The sample was drawn from an urban Pacific Northwestern population. Participants and their caregivers were recruited from three socioeconomically and ethnically diverse public middle schools and were followed longitudinally through emerging adulthood. At initial enrollment, participants were in 6<sup>th</sup> grade ( $M_{age} = 11.87$  years,  $SD = 0.46$ ). Survey data were collected at four time points during middle and high school when youth were in 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup>, and 9<sup>th</sup> grade. Survey data were subsequently collected at two more time points during emerging adulthood (T0: prior to intervention, and T2: one year after intervention). During the 6<sup>th</sup> grade wave of data collection, 386 of the 593 families were randomized to the treatment condition and 163 elected to complete all three sessions of the FCU (42%). During the emerging adulthood wave, 273 families were retained in the treatment condition and 134 elected to complete the FCU (49%). The current study utilizes emerging adult time-point data only (T0, T1, and T2), which includes youth self-report data on internalizing and externalizing behaviors, substance use, and sexual behavior, and observational data drawn from the feedback session of the FCU. At T1, the subsample of EAs was between the ages of 17 and 21 years ( $M = 19.75$ ,  $SD = 0.59$ ). All of the participants included in the current study were randomly assigned to receive the FCU intervention in middle

school and emerging adulthood. To be included in the current sample, participants must have completed the feedback session of the FCU during emerging adulthood. Ninety-five percent of the current subsample was retained from pre- ( $N = 134$ ) to post-intervention ( $N = 126$ ) at the emerging adulthood wave. Males and females represented 48.7% and 51.3% of the current study sample, respectively. The sample is culturally diverse: 58% European American/White, 33.6% African American/Black, 17.6% Hispanic/Latino, 7.6% Asian American, 5% Pacific Islander/Native American, and 2.5% other. The percentages representing racial/ethnic composition of the sample exceed 100 because a number of the participants identified with more than one racial/ethnic group. Additionally, 84.9% of the EAs in the study reported graduating from high school or receiving their general educational development (GED) certificate.

**Feedback session recording and coding.** Of the 134 completed feedback sessions, 133 were recorded with participant consent and one session was not recorded. Three feedback session videos were excluded because the recording did not have working audio and thus were not code able. An additional four session videos were excluded because an individual feedback was not conducted with the EA (only the family feedback was available). Therefore, a final sample of 126 videos were coded for therapist MI-adherence and client change language.

**FCU therapists.** Four doctoral-level therapists provided the FCU intervention to the study participants and were assessed for MI fidelity. Therapist 1 and Therapist 2 identified as Caucasian/European-American. Therapist 3 and Therapist 4 identified as Latinx/Hispanic and bilingual (Spanish and English), and they primarily provided FCU interventions to bilingual participants. As mentioned above, a sample of 126 feedback

sessions were coded for MI fidelity. A total of 83 sessions were completed by Therapist 1, 33 sessions were completed by Therapist 2, 2 sessions were completed by Therapist 3, and 9 sessions were completed by Therapist 4. A minimum of 6-8 observed MI sessions per therapist is required to obtain a good estimate of therapist treatment integrity; therefore, therapist 2's sessions were excluded from MI-fidelity analyses (Ismael, Baer, Martino, Ball, & Carroll, 2011).

## **Procedure**

Data used for the current study were collected at three time points during emerging adulthood: (T0) prior to engagement in the intervention, (T1) at the time of intervention, and (T2) 1 year post-intervention. Prior to the initial visit, participants were mailed questionnaires and asked to either bring the completed documents to the office when they came in for their initial visit or mail them back to the lab (T0). At T1, participants and their primary caregiver/parent came to the lab and completed the FCU feedback session. The feedback session was completed in two parts. First, EAs and caregivers/parents met with a therapist to complete a family feedback session that focused on the following: daily living (work/school/family, living situation/finances, time management), relationships (family relationship/communication, family problem solving, peer relationships, romantic relationships), and health and behavior (substance use, sexual/dating behavior, risky behavior, self-strengths). Next, therapists met individually with the EA to complete a feedback session focused on the same three areas as the family feedback with added discussion about daily stressors, physical/emotional health, and coping/self-esteem. For the purposes of the current study, only data from EA individual feedback sessions and surveys were analyzed. At T2, approximately 1 year after

participation in the FCU feedback session, questionnaires were mailed to participants with a self-addressed envelope so they could return the surveys by U.S. postal service.

## **Measures**

Self-reported measures included demographics (age, gender, level of education, and employment status) as well as sexual behavior, and alcohol and marijuana use, which are described in further detail below. Observational data were coded for MI-adherence and client change language. See Table 1 for a summary of all study variables. A description of the process for measuring and coding observational data is provided below.

**Substance Use.** An adapted measure of substance use was completed by EAs at T0 and T2 that assessed the frequency and quantity of alcohol, marijuana, and other drug use over the past 3 months (SUBSTS; Skinner & Allen, 1982; Stormshak, Fosco, & Dishion, 2010). The variables listed below represent health risk behaviors and serve as the count variable predicted in RQ 3a.

**Alcohol use.** Questions measuring the use of alcohol were asked in three sections (beer, wine/wine cooler/malt liquor, and hard liquor) and include, “How often did you drink beer in the last 3 months?” and “When you drank beer in the last 3 months, how much did you usually drink?” Items were rated on a scale from 0 (*Never*) to 8 (*2-3 times a day or more*), and 0 (*less than one can*) to 4 (*four to five cans*), respectively. For the purposes of analysis, the three sections assessing alcohol use were combined to create two separate composite variables (*alcohol frequency and alcohol quantity*). A mean score was computed to represent alcohol frequency by averaging the reported scores for each of the alcohol frequency items across the three sections of alcohol use. A sum score was computed to represent alcohol quantity by adding the responses for each of the alcohol

quantity measures across the three sections of alcohol use. Alcohol frequency (how often alcohol was consumed in the past 3 months) and alcohol quantity (how much alcohol was consumed in a single sitting) represent the count dependent variables (DVs) for this study.

An additional set of variables were computed with the alcohol frequency and quantity variables to categorize participants into low- and high-risk groups for both T0 and T2. Dichotomous items were computed by recoding Likert-type responses from the variables listed above to 0 (*low risk*) and 1 (*high risk*). The dichotomous variable for alcohol frequency was computed by coding participants who reported a 3 (*once every 2-3 weeks*) or lower for alcohol frequency as 0, and participants who reported a 4 (*once a week*) or higher as 1. Likewise, the dichotomous variable for alcohol quantity was computed by coding participants who reported a 3 (*three standard drinks*) or lower for alcohol quantity as 0, and participants who reported a 4 (*4-5 standard drinks*) or higher as 1.

***Marijuana use.*** The following two items were used to assess marijuana use: “How often did you use marijuana in the last 3 months?” and “When using marijuana, how much did you usually smoke?” Items were rated on a scale from 0 (*Never*) to 7 (*2-3 times a day or more*) and 0 (*1-2 hits*) to 5 (*more than 2 bowls or joints*), respectively. These two items were used as the count DVs for marijuana frequency and quantity.

Dichotomous variables were computed to indicate high and low risk groups by recoding Likert-type responses from the variables listed above to 0 (*low risk*) and 1 (*high risk*) for both T0 and T2. Participants who reported a 3 (*once every 2-3 weeks*) or lower for marijuana frequency were coded as 0, and participants who reported a 4 (*once a week*)

or higher were coded as 1. Similarly, participants who reported a 4 (*two or more bowls or joints*) or lower for marijuana quantity were coded as 0, and participants who reported a 5 (*more than two bowls or joints*) were coded as 1.

**Sexual behavior.** At T0 and T2, participants completed the Teen Interview (CINT), which was adapted from an original instrument developed by researchers at the Child and Family Center to assess a variety of youth behaviors including sexual behavior (Child and Family Center, 2001). CINT items were adapted to reflect the developmental changes that occur during emerging adulthood. The items used in the current study to assess EA sexual risk behavior include “Altogether during the last 3 months how many different people of the opposite sex have you had as sexual partners (this includes intercourse and/or anal sex)?” and “In the last 3 months how many people of the opposite sex have you had sex with and not used a condom?” Items in this instrument also assess for same-sex partners; however, very few participants endorsed these items so they were not included in the current study analyses. The first item listed above represents the DV for number of sexual partners and is rated by a self-reported count. The second item listed above represents the count DV for frequency of condom use and is reported on a 10-point scale. Response options range from 0 (*0 times*) to 9 (*41 or more*). Higher numbers on the frequency of condom use scale represent a lower frequency of condom use, as the item asks about frequency of intercourse without a condom.

Following a similar procedure to that which was outlined in the alcohol and marijuana use sections, dichotomous items were computed to indicate high and low risk groups by recoding counts and Likert-type responses from the variables listed above to 0 (*low risk*) and 1 (*high risk*) for both T0 and T2. To create the sexual partner risk groups, participants who reported two or less sexual partners were coded as 0, and participants

who reported three or more sexual partners were coded as 1. Likewise, to create the condom frequency risk variable, participants who indicated a zero frequency of intercourse without a condom were coded as 0 and those who endorsed any frequency of intercourse without a condom were coded as 1.

**Overall risk.** Using the dichotomous variables for alcohol quantity risk (binge drinking), marijuana frequency risk, and sexual partner risk, an ordinal variable was created to represent participants' overall risk. The three dichotomous risk variables were summed. Participants overall risk was therefore quantified to represent four groups: 0 (*no engagement in risk behaviors*), 1 (*engagement in one risk behavior*), 2 (*engagement in two risk behaviors*), 3 (*engagement in all three risk behaviors*). Overall risk was computed at T0 and T2 and represented the ordinal DV predicted in RQ 3b.

Additionally, the manner in which the overall risk variable was calculated might account for the differences observed between the findings of RQ 3a and RQ 3b. Specifically, the overall risk variable was calculated using only alcohol quantity (binge drinking), marijuana frequency, and number of sexual partners rather than using each of the health risk behavior variables included in RQ 3a analyses. The author decided to focus specifically on these three areas of risk for RQ 3b because of the negative health impacts EAs experience as a result of such behaviors, measurement issues related to marijuana quantity, and the prevalence rates of binge drinking and casual sexual encounters within the EA population. According to the National Survey on Drug Use and Health (NSDUH, 2010), 79% of EAs reported patterns of binge drinking, and binge drinking is related to adverse brain development (Mashhoon et al., 2014) and elevated engagement in other risky behaviors (Silveri, 2012). With regard to marijuana frequency



versus marijuana quantity, there is not a standardized method of measuring marijuana quantity (Mariani, Brooks, Haney, & Levin, 2011) and more frequent cannabis use is associated with negative health and social consequences (Arria, Caldeira, Bugbee, Vincent, & O'Grady, 2015). Lastly, number of sexual partners was chosen due to the prevalence of casual sexual encounters within EA populations and due to the implications of having multiple sexual partners on the likelihood of contracting an STD (Claxton & van Dulmen, 2013).

**Therapist adherence to MI.** Random 20-minute video segments from EA individual feedback sessions of the FCU were coded for therapist MI-fidelity utilizing the MITI 4 (Moyers et al., 2014). The MITI 4 focuses on the therapists' verbal responses and includes both global ratings of MI-spirit and specific behavior counts to document intervention fidelity (Hendrickson et al., 2004; Moyers et al., 2005). Global codes reflect the holistic evaluation of therapist behaviors and are separated into two domains: relational codes and technical codes (Moyers et al., 2014). The relational global codes measure the extent to which therapists engage in collaborative processes with clients and the extent to which therapists convey empathy, and the technical global codes measure the extent to which therapists effectively respond to both CT and ST (Moyers et al., 2014). Each of these global ratings is coded on a 5-point Likert scale with a minimum of "1" and a maximum of "5." For the relational global, the coder assumes a default score of "3" and moves the score up or down to indicate therapist level of adherence (Moyers et al., 2014). A score of "1" is indicative of therapists' explicit omission of MI principles and spirit, and a score of "5" is indicative of therapists' marked and consistent effort to adhere to MI principles and spirit (Moyers et al., 2014). While listening to each 20-

minute segment, coders also tally behavioral counts to measure the frequency at which each behavior occurs and include the following 11 therapist behaviors: giving information, persuade, persuade with permission, question, simple reflection, complex reflection, affirm, seeking collaboration, emphasizing autonomy, and confront. The behavior counts include both MIA (affirm, seeking collaboration, and emphasizing autonomy) and MINA (persuade and confront) behaviors as well as neutral (giving information) behaviors. Global scores are impacted by the manner in which therapists exhibit each behavior. For example, when therapists use reflections (both simple and complex), questions, and affirmations in a manner that strengthened and deepened CT, the technical score increased. Whereas, when therapists used reflections, questions, and affirmations in a way that strengthened or deepened ST, technical scores decreased. Similarly, the use of behaviors such as persuade with permission, seeking collaboration, and emphasizing autonomy increased relational scores. Whereas, the use of behaviors such as persuade and confront decreased relational scores. Experts who developed the MITI state that critical indices of MI are better indicated through the use of summary scores (Moyers et al., 2014); therefore, once frequencies and global codes were obtained, summary scores were computed from code frequencies and global scores. See Table 1 for a description of how these summary scores were computed. Determinants of overall therapist competence are presented in Table 2. It is important to note that the proficiency thresholds in Table 2 were drawn from the MITI 4 manual and are solely based upon expert opinion rather than normative data (Moyers et al., 2014).

**Client change language.** The CLEAR (Glynn & Moyers, 2012) classifies and quantifies client language as either favoring or counter to behavioral change, which

allows for the investigation of the therapeutic process (Baer et al., 2004; Moyers, Martin, Catley, Harris, & Ahluwalia, 2003). To measure client language that favors behavior change (CT) or maintaining the status quo (ST), coders listened to the complete EA individual feedback session and tallied each occurrence of CT and ST using the CLEAR to yield total counts for each type of utterance. To better represent the proportion of CT used by clients during the FCU feedback session, CT and ST counts were transformed into a composite variable by subtracting total ST counts from total CT. Positive numbers indicate a higher number of CT than ST utterances and negative numbers indicate a lower number of CT than ST utterances. The proportion of CT to ST will henceforth be referred to as CT-ST.

Coders also rated the extent to which clients engaged in active intrapersonal exploration using the global self-exploration code derived from the MISC 2.1 (Miller et al., 2008). These global ratings are coded on a 7-point Likert scale with a minimum of “1” and a maximum of “7.” A score of “1” demonstrates that no personally relevant material is discussed by the client during the session, and a score of “7” demonstrates that the client actively engaged in exploration of values, feelings, relationships, fears, life-choices, and perceptions of others (Miller et al., 2008). Personally relevant material is defined by Miller and colleagues (2008) as shared information about personal problems, self-descriptions that give insight into one’s internal experiences, expressions of emotions, exploration of personal values, and private material that has the potential to make the client more vulnerable.

***Training of coders.*** A team of five coders completed the data collection for the current study. One coder was a first-year counseling psychology doctoral student, three

were undergraduates majoring in psychology, and the author of the current manuscript served as the fifth coder and expert comparison to which the team was compared for interrater reliability (IRR). Four of the coders identified as Caucasian/European-American, and one coder identified as Hispanic/Latinx and was bilingual in English and Spanish. To recruit coders, an email advertisement was sent to the University of Oregon psychology department student coordinator and posted to the student website. Three coders were assigned to code client change language with the CLEAR and MISC 2.1, and two coders were assigned to code therapist MI-adherence with the MITI 4. Coder training followed recommendations in the CLEAR and MITI 4 manuals (Miller et al., 2003). See Appendix B for the MITI 4 coding manual, Appendix C for the subsection of the MISC 2.1 coding manual that refers to the coding protocol for the measurement of self-exploration, and Appendix C for the CLEAR coding manual. For PDF copies of the coding manuals please refer to <http://casaa.unm.edu/codinginst.html>.

Training began with self-review of MI textbooks and video learning tools, followed by participation in a 4-hour online MI training course developed by the Addiction Technology Transfer Center Network (ATTC, 2015; <http://tourofmi.com>). Coders were then required to participate in an 8-hour in-person training. This training included a review of MI principles, an introduction to the MITI 4, CLEAR, and the MISC 2.1 global code, followed by group practice of coding and discussions about decision rules for each code. Coding, both for training and data collection, was completed using only the audio from FCU feedback sessions, per recommendations from MITI and CLEAR developers (Glynn & Moyers, 2012; Moyers et al., 2014). Once coders were familiarized with the coding protocols, coders engaged in approximately 40 hours of

practice coding to reach IRR. Videos used for the practice coding were drawn from MI instructional DVDs that were previously coded by experts at the University of New Mexico Center for Alcoholism, Substance Abuse, and Addiction (CASAA; <https://casaa.unm.edu/codinginst.html>) and FCU feedback sessions obtained from the Prevention Science Institute database from a previous research study in which the FCU intervention was provided to a sample of adolescents. Authorization was granted by the University of Oregon Institutional Review Board for coders to have access to FCU videos for the purposes of this training and data collection. Furthermore, weekly group coding meetings were held throughout the duration of data collection to optimize reliability. Weekly coding meetings consisted of discussions of decision rules, and coders were able to compare codes from practice videos to identify discrepancies in IRR. Coding fidelity was assessed for a randomly selected 20% of the videos to maximize consistency of the coding procedures for all videos. Following recommendations made by Cicchetti (1994), IRR was considered poor for intraclass correlation (ICC) values of .40, fair for values of .41-.59, good for values of .60-.74, and excellent for values of .85-1.0 for CLEAR and MISC 2.1. All coders were within the good to excellent range of IRR for the client coding. IRR for the MITI 4 was much more difficult to obtain, so less stringent criteria were utilized. Specifically, according to Landis and Koch (1977), IRR is considered fair for ICC values of .21-.40, moderate for values of .41-.60, substantial for values of .61-.80, and perfect for values of .81-1.0. Coders were within the moderate to substantial range for each of the MITI 4 summary scores according to these criteria except percent complex reflection (%CR), which fell in the fair range. As a result, %CR was excluded from all of the analyses. ICC results are presented in Table 3.

***Training of therapists.*** Therapists in this study were doctoral level psychologists with varying degrees of exposure to MI who had been previously trained in the FCU through a variety of means, such as attending a training workshop or working on prior projects that utilized this model. All therapists were required to read *Motivational Interviewing: Helping People Change* (Miller & Rollnick, 2013) as part of their FCU training and attend a full-day workshop on the use of MI skills. The FCU training was delivered by a senior therapist and included a variety of topics, such as understanding the ecological model (Bronfenbrenner, 1989), FCU model (i.e., description of each session), literature supporting efficacy of the FCU, key skills for implementing the FCU (e.g., empathy, strengths-based, case conceptualization), interviewing skills needed to complete the intake, conducting an ecological assessment, and MI. Specific content addressed in the MI training included: use of OARS, supporting self-efficacy, developing discrepancy, and expressing empathy. After training, therapists were required to observe three live FCUs (all three sessions: initial interview, ecological assessment, and feedback session), and were subsequently observed leading two FCUs. The final step before being authorized to lead the FCU independently was to have the two observed FCUs coded using the COACH (Smith et al., 2013a). Therapists' COACH ratings needed to be within the satisfactory range (minimum score of 5) prior to being authorized to provide the FCU independently to participants in the study. Approximately two-thirds of the way through T1 data collection, an additional MI training was offered to study therapists by a certified trainer. However, none of the therapists were trained to reliability or certified in MI before or during the course of the study. Once therapists were authorized to provide the FCU independently, weekly group supervision meetings focused on case

conceptualization and delivery of feedback were held to maximize treatment fidelity.

Supervision targeting the delivery of feedback emphasized the use of video feedback and sensitivity with which feedback was delivered.

### **Analytic Strategy**

**Recoding variables to account for skip patterns.** There were a number of cases in the data set that were left blank due to skip items; therefore, those cases were treated as 0's and treated as responses indicative of lack of endorsement rather than missing data. This choice was made due to the nature of the items that were skipped. For example, when a participant marked a zero for the questions, "Did you use alcohol during the past 3 months? (Yes = 1, No = 0)," the subsequent items that ask about alcohol frequency and quantity during the past three months are skipped. The logical assumption follows that if someone has not used alcohol in the past three months, then their answers will also be zero for questions about frequency and quantity of alcohol use for the same time period.

**RQ 1.** The overarching goal of this study is to evaluate FCU treatment fidelity through the examination of the use of MI within the FCU feedback session, a key theoretical component of the FCU intervention (Dishion & Stormshak, 2007). Thus, RQ 1 asks, to what extent do therapists use maintain fidelity to MI in the FCU feedback sessions? The independent variable (IV) was a categorical variable representing the different therapists and had three groups: Therapist 1, Therapist 2, and Therapist 4. As aforementioned, Therapist 2 was excluded from analyses examining MI fidelity. The DVs were continuous and represented the technical, relational, R:Q, MIA, and MINA summary scores measured by the MITI 4. An exploration of group and individual therapist means on MITI 4 summary scores will determine the extent to which therapists

met indicated benchmarks for MI-adherence, as specified by experts (Moyers et al., 2014). To assess assumptions of normal distribution for each of the MITI 4 summary scores, measures of skewness will be examined using a cutoff of  $\pm 2$  to determine whether non-parametric tests are warranted. Following examination of descriptive statistics, one-way between subjects Analyses of Variance (ANOVA) will be conducted to determine if differences between therapists are statistically significant. Assumptions of homogeneity of variance will be examined using a Levene's Test of Homogeneity of Variance. An alpha level equal to or less than .05 will indicate that the assumption of homogeneity of variance is not met (reject the null hypothesis). In this case, a Kruskal-Wallis Non-Parametric test will be conducted and interpreted instead.

**RQ 2.** An additional aim of the current study is to determine whether a positive relationship exists between MI-adherence and client change language. Therefore, Pearson's bivariate correlations will be conducted to assess the relationship between therapists' MITI 4 summary scores and client change language (CT-ST and self-exploration). If any of the variables do not meet assumptions of normality, as determined by the skewness cutoffs described above, Spearman's rank order correlations will be conducted. MITI summary scores for all four therapists will be included in these analyses.

**RQ 3.** To assess whether MI-adherence and client change language predict EA post-intervention health risk behaviors, a series of regressions will be conducted. MITI 4 summary scores will represent MI-adherence and will be included in the regression models as continuous IVs. MITI summary scores for all four therapists will be included in these analyses. Additionally, the composite CT-ST variable, drawn from CLEAR



behavior counts, and self-exploration (MISC 2.1 global) will be included in the regression models as continuous IVs representing client change language.

Poisson regression will be conducted to determine whether MI-adherence and client change language predict the variance in EA health risk behaviors 1 year post-intervention (RQ 3a). Additionally, the dichotomous risk group variables for T0 will be included as control variables to determine if MI-adherence and client change language predict post-intervention health risk behaviors above and beyond pre-intervention health risk behaviors. Assumptions of model fit will be examined to determine whether Poisson regression is an appropriate approach. In the case that the model demonstrates inadequate fit ( $\text{deviance/df} \geq 2$ ), negative binomial regressions will be conducted instead. When studying risk behaviors, there is often a high frequency of zeroes and positive skewness in the data, indicating that a large proportion of participants have not engaged in the behavior. Additionally, because risk behaviors are often measured via a count of the frequency with which one engages in risky behaviors, these outcome variables are often best categorized as count variables. Poisson and negative binomial regressions are generalizations using counts (i.e. incident rate) instead of odds ratios or prediction scores. Given the distribution of the current study's DVs, Poisson and negative binomial regressions are well-suited for determining the degree to which the IVs predict the incident rate of each risk behavior (Gardner, Mulvey, & Shaw, 1995).

Ordinal regressions were conducted to determine if MI-adherence and client change language predict EA overall risk behavior 1 year post-intervention (RQ 3b). The T2 overall risk variable represented the categorical variable for this regression and T0 overall risk variable was inputted into the regression as a control for pre-intervention

health risk behaviors. Ordinal regressions (a.k.a. **Polytomous Universal Model**; PLUM) are generally used when the DV is categorical and ordered to denote a cumulative count (Harrell, 2015). In this case, the DV is represented by the overall risk variable and has four ordered risk categories that characterize a progressive level of engagement in health risk behaviors: (0) zero engagement in high-risk behaviors, (1) engagement in one high-risk behavior, (2) engagement in two high-risk behaviors, and (3) engagement in three high-risk behaviors. The ordinal regression model predicting the probability of a person being in a higher risk category is as follows:

$$\text{Ln}(\theta_j) = \alpha_j - \beta_j X_{1-7}$$

In the model above,  $j$  ranges from 1 to the number of DV categories minus 1. In this case  $j$  ranges from 1-3 since there are four categories. Each logit has its own  $\alpha_j$  term but has the same  $\beta$ , signifying that the effect of the IV is the same for the different logit functions (i.e., proportional odds). This assumption is assessed using a test of proportional odds for which a  $p$ -value greater than or equal to .05 is acceptable.

**Power analysis.** The sample size needed for a study to detect significant effects of a given magnitude (Cohen, 1992; when effect size is small,  $d = .2$ ; medium,  $d = .5$ ; and large,  $d = .8$ ) depends on many factors, including the size of the model, distribution of the variables, reliability of the variables, number of repeated measurements, and strength of the relationships among the variables. For analyses using regression-based techniques such as ANOVA or regression, power analyses indicate that a sample size of 60 is adequate to detect moderate effects. Therefore, power is adequate for the current study's more traditional analyses. Power analyses for the proposed study were carried out using G\*Power version 3.0.10. The author examined power for a sample of 126 individuals. A

minimum of 7 predictors were assumed. Results indicate that with a sample of 126, the proposed study has 90% power to detect medium to large effects ( $d \geq .55$ ).

**Missing data.** The primary missing data problem in any longitudinal study stems from attrition. The current study retained 95% of participants between pre-intervention and post-intervention time points. Thus, missing cases were excluded from analyses.

## CHAPTER III

### RESULTS

#### **Therapist Treatment Fidelity (RQ 1)**

Overall group means for the technical, relational, and R:Q were at or above the fair benchmark of competence. Specifically, therapists in the current study reached fair competency for the technical global (see Figure 2), and were approaching good competency for the relational global (see Figure 3) and R:Q (see Figure 4). Differences in individual therapist means were observed. Therapist 1 met the fair benchmark for both the technical global and R:Q and surpassed the good benchmark for the relational global. Therapist 2 met the fair benchmark for R:Q and fell below the fair benchmark for the technical and relational global scores. Therapist 4 met the fair benchmark for both the technical global and fell below the fair benchmark for the relational global and R:Q. Overall group means of MIA exceeded those of MINA, indicating that therapists as a whole were utilizing more MI-adherent behaviors during the feedback sessions than MI non-adherent behaviors. Differences between therapists were observed, with Therapist 2 demonstrating less frequent use of MIA and more frequent use of MINA in comparison to the other two therapists; however, all individual therapist means were higher for MIA than MINA. See Figure 5 for the group and individual therapist means for the MIA and MINA.

To further examine between-therapist differences, data were analyzed with a one-way, between-subjects ANOVA. The IV was a categorical variable of the different therapists and had three groups: Therapist 1, Therapist 2, and Therapist 4. The DVs were continuous and represented the technical, relational, and MIA summary scores as

measured by the MITI 4. ANOVA results demonstrate that the total variation in each of the DVs is attributable to differences in therapist. There was a statistically significant difference between groups on technical scores,  $F(2, 122) = 29.94, p < .001$ , and a statistically significant difference between groups on MIA scores,  $F(2, 122) = 6.71, p < .01$ . The test for normality examining standard skewness and kurtosis of the relational score variable indicated the data were statistically normal. However, the assumption of homogeneity was not met for the relational DV, even after removing Therapist 4 ( $n = 9$ ),  $F(2, 121) = 3.64, p < .05$ . Therefore, a Kruskal-Wallis Non-Parametric test was conducted. Results from the Kruskal-Wallis Non-Parametric analysis demonstrate that there was a statistically significant difference between the relational scores by therapist,  $H(2) = 32.61, p < .001$ . The R:Q and MINA variables exceeded cutoffs for skewness and kurtosis; thus, not satisfying assumptions of normality. Therefore, Kruskal-Wallis Non-Parametric tests were conducted again to examine whether the differences between therapists' means on R:Q and MINA were statistically significant. Results from the Kruskal-Wallis Non-Parametric test demonstrate a statistically significant difference between R:Q scores by therapist,  $H(2) = 10.93, p < .01$ . Lastly, there was a statistically significant difference between MINA scores by therapist,  $H(2) = 38.69, p < .001$ .

Post-hoc comparisons, using the Bonferroni post hoc procedure to correct for alpha inflation, were conducted to determine which pairs of the three therapists differed significantly across technical, relational, and MIA indicators of MI-adherence. Therapist 1 and Therapist 4 had significantly higher average scores on the measure of technical skills than Therapist 2. However, the difference between Therapist 1 and Therapist 4 on the measure of technical skills was not significant. On the measure of relational skills,

Therapist 1 had a significantly higher average score than both Therapist 2 and Therapist 4. No significant differences were found between the relational scores of Therapists 2 and 4,  $H(1) = .04$ , *ns*. See Figure 6.

When differences in R:Q were examined in pairs, Therapist 1 had a mean rank that was statistically higher than that of Therapist 2,  $H(1) = 6.43$ ,  $p = .01$ . Therapist 1 also had a statistically higher mean rank than Therapist 4,  $H(1) = 6.35$ ,  $p = .01$ . No significant differences were found between the R:Q scores of Therapists 2 and 4,  $H(1) = .85$ , *ns*. See Figure 7.

On the measure of MIA behaviors, Therapist 1 had a significantly higher average score than Therapist 2. The difference between Therapist 1 and Therapist 4 was non-significant. When differences in MINA were examined in pairs, Therapist 1 had a mean rank that was statistically lower than that of Therapist 2,  $H(1) = 34.97$ ,  $p < .001$ . The difference between MINA for Therapist 1 and Therapist 4 was not statistically significant,  $H(1) = .69$ , *ns*. There was a statistically significant difference between Therapist 2 and Therapist 4,  $H(1) = 16.34$ ,  $p < .001$ . See Figure 8.

### **Relationship Between MI-Adherence and Change Language (RQ 2)**

Correlations amongst therapist MI-adherence and client change language variables were examined to determine the relation between therapist and client behaviors as specified in RQ 2. Summary scores from the MITI 4 represented therapist MI-adherent and non-adherent variables. Client global scores on the MISC 2.1 self-exploration scale and the calculated proportion of CT-ST derived from the CLEAR behavior counts represented client change language variables. Spearman's rank-order correlations were run to assess the relationship between client change language and R:Q and MINA

because those two MITI 4 summary score variables (R:Q and MINA) did not meet assumptions of normality. All other variables were normally distributed and therefore were analyzed with Pearson correlations. Based on the results of Pearson correlations, there was a statistically significant positive correlation between CT-ST and the technical variable. Similarly, a statistically significant positive correlation was found between CT-ST and the relational variable. No relationship was found between CT-ST and MIA. Additionally, there were no statistically significant relationships found between client self-exploration and the technical, relational, or MIA. Based on the results of Spearman's rank-order correlations, client self-exploration had a statistically significant positive relationship with R:Q. There were no statistically significant relationships between client self-exploration and MINA, and there were no statistically significant relationships between CT-ST and R:Q or MINA.

**Summary.** Statistically significant positive relationships were found between CT-ST and therapist technical and relational scores. Similarly, statistically significant positive relationships were found between CT-ST and therapist R:Q scores. There was no relationship between CT-ST and therapist MIA scores. All other relationships between indicators of MI-adherence and client change language were not significant. See Table 4.

### **Predictions of EA Post-Intervention Health Risk Behaviors (RQ 3a)**

A series of Poisson and negative binomial regressions were conducted to determine the amount of variance explained by therapist MI-adherence and client change language for each of the following DVs at T2: alcohol frequency, alcohol quantity, marijuana frequency, marijuana quantity, number of sexual partners, and frequency of

condom use. Table 5 provides a summary of the Poisson and negative binomial regression results.

**Alcohol use.** Beginning with alcohol frequency as the count variable, a Poisson regression was conducted and there was good model fit (deviance/df = 1.19, AIC = 413.34, BIC = 438.87). Results from the omnibus test indicated that baseline (T0) alcohol frequency risk was the only significant predictor of alcohol frequency at T2. Based on these data, we would predict that initially low-risk participants (T0: alcohol frequency risk = 0) would have a decrease in alcohol frequency at T2 by a factor of 0.50. MI-adherence and client change language did not significantly predict the variance in alcohol frequency at T2 above and beyond initial risk status.

Because the Poisson regression model demonstrated inadequate fit (deviance/df = 2.11, AIC = 630.95, BIC = 656.48), a negative binomial regression was conducted to examine relations amongst initial risk, MI-adherence, client change language and alcohol quantity. Model fit statistics indicated that the negative binomial regression was a more appropriate technique (deviance/df = 0.54, AIC = 604.29, BIC = 629.81). Results from the omnibus test indicated that baseline alcohol quantity risk was the only significant predictor. Based on these results, we would predict that initially low-risk participants would have a decrease in alcohol quantity at T2 by a factor of 0.40. MI-adherence and client change language did not significantly predict the variance in alcohol quantity at T2 above and beyond T0 alcohol quantity risk.

**Marijuana use.** The Poisson regression did not meet model fit criteria (deviance/df = 3.61, AIC = 567.38, BIC = 592.91), so a negative binomial regression was conducted to examine relations amongst initial risk, MI-adherence, client change



language, and marijuana frequency. The model fit statistics indicated that the negative binomial regression was a more appropriate technique (deviance/df = 1.47, AIC = 452.64, BIC = 478.17). Results indicated that baseline marijuana frequency risk and therapist technical scores were statistically significant predictors. That is, we would predict that initially low-risk participants would have a decrease in marijuana frequency by a factor of 0.40 at T2. Similarly, higher therapist technical scores predicted a decrease in marijuana frequency at T2 by a factor of 0.68. All other indicators of MI-adherence were non-significant predictors of above and beyond initial risk and therapist technical scores. Indicators of client change language were also non-significant predictors of T2 marijuana frequency above and beyond the previously mentioned factors.

Because the model fit criteria for Poisson regression were not met (deviance/df = 2.57, AIC = 427.43, BIC = 452.95), a negative binomial regression was conducted to determine how much of the variance in T2 marijuana quantity is accounted for by predictors. The model fit statistics indicated that the negative binomial regression was a more appropriate technique (deviance/df = 1.26, AIC = 357.67, BIC = 383.20). Results from the omnibus test indicated that baseline marijuana quantity risk, therapist technical scores, R:Q, client self-exploration, and CT-ST were all significant predictors of T2 marijuana quantity. Based on these results, we would predict that initially low-risk participants would have an increase in marijuana quantity at T2 by a factor of 3.78. Higher therapist technical scores predicted a decrease in marijuana quantity at T2 by a factor of 0.61. Similarly, higher therapist R:Q scores predicted a decrease in marijuana quantity at T2 by a factor of 0.63. All other indicators of MI-adherence were non-significant predictors of T2 marijuana quantity. Higher degrees of client self-exploration

predicted an increase in marijuana quantity at T2 by a factor of 1.33. Lastly, higher CT-ST predicted a decrease in marijuana quantity at T2 by a factor of 0.98.

**Sexual behavior.** To determine how much of the variance in number of sexual partners at T2 is accounted for by predictors, a Poisson regression was conducted and it demonstrated good model fit (deviance/df = 1.31, AIC = 339.40, BIC = 364.93). Results from the omnibus test indicated that baseline sexual partner risk and client self-exploration were the only significant predictors. Based on these results we would predict that initially low-risk participants would have a decrease in number of sexual partners at T2 by a factor of 0.30. Contrarily, higher degrees of client self-exploration predicted an increase in number of sexual partners at T2 by a factor of 1.47. MI-adherence did not significantly predict the variance in number of sexual partners at T2 above and beyond initial sexual partner risk. Likewise, CT-ST did not significantly predict the variance in number of sexual partners at T2 above and beyond initial sexual partner risk.

To determine how much of the variance in T2 condom use frequency is accounted for by the predictors, a Poisson regression was conducted. The model fit statistics indicated goodness-of-fit (deviance/df = 1.81, AIC = 340.26, BIC = 365.79). Result from the omnibus test indicated that baseline condom use risk and therapist technical scores were the only significant predictors. Based on these data, we would predict that initially low-risk participants (T0 condom frequency risk = 0) would have an increase in frequency of sexual intercourse without a condom at T2 by a factor of 1.94. In contrast, higher therapist technical scores predicted a decrease in frequency of sexual intercourse without a condom at T2 by a factor of 0.70. No other indicators of MI-adherence and

neither of the client change language variables had a significant effect on T2 condom use frequency above and beyond initial condom frequency risk.

**Summary.** These results indicate that initial risk status across each type of health risk behavior is the greatest predictor of health risk behavior 1 year post-intervention. Specifically, when participants are initially classified as low-risk at T0, they are significantly more likely to have a decrease in health risk behavior at T2, except when predicting marijuana quantity and frequency of condom use. Low marijuana quantity risk at baseline (T0) predicted increases in marijuana quantity at T2, and low condom frequency risk at baseline predicted increases in frequency of sexual intercourse without a condom at T2. With regard to MI-adherence, higher therapist technical scores predicted decreases in marijuana frequency and quantity and an increase in condom use (less frequent intercourse without a condom) but did not predict any other health risk behaviors at T2 above and beyond initial risk. Therapist R:Q also predicted a decrease in marijuana quantity but did not significantly predict any other health risk behaviors at T2 above and beyond initial risk. Regarding client change language, higher client self-exploration predicted an increase in both marijuana quantity and number of sexual partners, but did not significantly predict any other health risk behaviors at T2 above and beyond initial risk. CT-ST was only predictive of a decrease in marijuana quantity but not predictive of any other health risk behaviors at T2.

### **Predictions of EA Post-Intervention Overall Risk (RQ 3b)**

An ordinal regression was conducted to determine whether MI-adherence and client change language predict overall risk behavior 1 year post-intervention. The complete model had goodness-of-fit ( $\chi^2 = 37.12, p < .001$ ), with 28% of the variance in

overall risk explained by the model. Looking more closely at the ordinal regression results, when compared with T0 highest overall risk (T0 overall risk = 3), engaging in zero risk behaviors at T0 significantly predicted the likelihood that someone would be in a lower overall risk category ( $\exp(b) = 0.45$ ). However, engagement in one or two risk behaviors at T0 did not have a significant effect on T2 overall risk. Furthermore, for every increase in therapist technical scores, we would predict a higher likelihood of someone being in a higher overall risk category at T2 ( $\exp(b) = 1.86$ ). Whereas, for every increase in therapist relational scores, we would predict a lower likelihood of someone being in a higher overall risk category at T2 ( $\exp(b) = 0.45$ ). None of the other indicators of MI-adherence had a significant effect on T2 overall risk. Similarly, client change language did not have a significant effect on T2 overall risk. Results from these analyses are summarized in Table 6.

## **CHAPTER IV**

### **DISCUSSION**

Results of the current study found that FCU therapists had fair treatment fidelity. Indicators of MI-adherence, such as the technical, relational, and R:Q scores, had positive relationships with the proportion of client CT used during FCU feedback sessions. When predicting post-intervention health risk behaviors, higher technical scores predicted decreases in marijuana frequency and quantity and increases in condom use. Similarly, higher therapist R:Q and higher CT-ST predicted decreases in marijuana quantity. In contrast, higher self-exploration predicted increases in marijuana quantity and number of sexual partners. Finally, when predicting post-intervention overall risk, higher therapist technical scores predicted higher overall risk, and higher therapist relational scores predicted lower overall risk.

To date, studies investigating FCU treatment fidelity have focused solely on the manner in which feedback is given to clients (i.e., video feedback, sensitivity with which feedback is given; Smith et al., 2013a; 2013b), and studies examining mechanisms of change have found that parent engagement and parenting skills mediate later changes in child/youth behaviors (Dishion et al., 2008). However, very little is known about how the use of specific in-session MI behaviors and techniques influence the therapeutic process and promote behavior changes. The current study addressed this gap in the literature by using a detailed measure of therapists' in-session MI techniques and MI-spirit to measure FCU therapists' MI fidelity. The study also investigated the relationship between therapists' MI fidelity and client change language through the examination of the therapeutic process (i.e., client self-exploration) and client in-session statements about a

target change behavior (i.e., CT and ST). In addition, the study aimed to determine whether MI fidelity and client change language were predictive of subsequent client health risk behaviors at a 1 year post-intervention follow-up assessment. The current study is unique in that, rather than examining caregiver response to treatment and later child/youth outcomes, we examined the direct influence of participants' in-session responses to treatment on their health outcomes 1 year later. Specifically, because we used an EA sample and focused on EA individual feedback sessions, we were able to measure the extent to which therapists' in-session behaviors directly influenced EA in-session responses and subsequent behavior changes at a 1 year post-intervention follow-up. Although substantial evidence exists that demonstrates positive effects of both MI and the FCU on client outcomes (Caruther et al., 2014; Cushing et al., 2014), the current study is the first to document whether MI techniques are a mechanism of change within the FCU treatment model.

### **Treatment Fidelity**

RQ 1 aimed to determine the extent to which therapists adhere to MI principles and techniques during the FCU feedback session. It was hypothesized that therapists would have fair MI fidelity and would use more MIA than MINA behaviors during the FCU feedback session. Overall, this hypothesis about therapist MI fidelity was partially supported.

As predicted, therapist group means on the MITI 4 met or exceeded the minimum “fair” competency benchmark, and therapists as a group used more frequent MIA behaviors than MINA behaviors during the FCU feedback sessions. Therapists with previous clinical experience have higher baseline proficiencies in MI than community

provider samples (Darnell et al., 2016; Miller et al., 2004). Therefore, the confirmation of initial hypotheses that therapists would meet a minimum competency equal to or greater than the fair benchmark is not surprising. Given what we know about the effects of MI fidelity on client outcomes, these results bring to question whether FCU therapists' MI fidelity could be even further improved through targeted feedback and coaching of MI techniques.

With enhancement of MI fidelity in mind, it is important to note that significant differences between therapists were found for each of the MITI 4 summary scores, with Therapist 1 demonstrating significant superiority in MI fidelity over the other two therapists in the sample. Furthermore, Therapist 2 fell below the fair benchmark of MI fidelity for the global codes representing MI spirit and used significantly more MINA behaviors than the other two therapists. Similarly, Therapist 4 did not meet the "fair" threshold of MI fidelity for the relational global or for the R:Q, and was just above the fair benchmark for the technical global. Both Therapists 2 and 4 used much less MIA behaviors than Therapist 1. However, Therapist 4 typically avoided MINA behaviors, which, according to Gaume et al. (2009), might be more influential to client outcomes than the frequency with which MIA behaviors are used.

The significant differences observed between therapists could be attributed to a number of factors. Previous research has suggested that clients' change language is related to therapist MI fidelity, such that, greater frequency of ST relates to more therapist reflections of ST and use of MINA (Miller & Rollnick, 2013). However, the current study results did not indicate a significant relationship between MINA and CT-ST. It is possible that therapist fidelity scores were impacted by client factors that were

not accounted for in study analyses and data collection. For example, client temperament and/or motivation to change may have played a role in how therapists responded to clients during the FCU feedback session. Therapist 1 had a larger sample of feedback sessions that were assessed for fidelity; therefore, Therapist 1's sample of videos coded for MI fidelity might have been composed of primarily easy-going and highly motivated individuals. In contrast, Therapists 2 and 4 conducted fewer sessions, which could have limited the variability of their scores and their scores could have been skewed by difficult client presentations during the feedback sessions. Therefore, if a good portion of Therapist 2's clients presented with discord (low motivation to change) and used frequent ST, then it is likely that his/her use of MI reflected an adjustment to client needs that was not accounted for in the analyses.

An additional explanation of these results could be that Therapist 2 was the most senior therapist in the study and may have had a longer lapse in time between MI training and implementation of the skills. Consistent with previous research, this therapist's lower scores could reflect a drop in proficiency resulting from a lack of further MI training support, such as feedback and/or coaching to increase retention of proficiency levels (Chiapa et al., 2015; Miller et al. 2004). Because the weekly supervision in which therapists participated was more focused on conceptualization and delivery of feedback rather than MI techniques, MI fidelity might have decreased as a natural consequence of not being as attuned to those aspects of the intervention. Similarly, Therapist 1 completed a pre-doctoral internship at a Veterans Administration site and participated in a major rotation in which supervision entailed MI coaching and tailored feedback. Therefore,



Therapist 1's scores might be reflective of his/her more recent completion of this milestone and training experience.

As for Therapist 4, cultural factors might account for his/her lower fidelity scores. A recent study conducted with a sample of adolescents found that therapists used significantly less MI skills when working with Hispanic youth than when working with Non-Hispanic youth (Ewing, Gaume, Ernst, Rivera, & Houck, 2015). Therapist 4 provided the FCU intervention primarily to Hispanic/Latinx participants and might have adjusted the delivery of the intervention to fit with the cultural norms of this population. Additionally, several of Therapist 4's sessions were in Spanish or were conducted using a combination of Spanish and English. Therefore, it is possible that his/her MI skills varied depending on the language in which the intervention was delivered, which might have contributed to his/her lower MI fidelity scores.

### **MI and Client Change Language**

RQ 2 aimed to determine whether there is a positive relationship between MI-adherence and client change language. It was hypothesized that higher MI-adherence (i.e., technical, relational, R:Q, and MIA scores) would significantly relate to higher CT-ST and self-exploration, and that higher MINA would significantly relate to lower CT-ST. Hypotheses about the relationship between MI fidelity and client change language were also partially supported.

Significant positive relationships were found between CT-ST and the technical, relational, and R:Q summary scores of the MITI 4. These results support initial hypotheses that higher MI fidelity would relate to more CT during the FCU feedback sessions, and they confirm previous research findings indicating that therapists' attention

to and evocation of CT through the use of reflections and open-ended questions increases the frequency with which clients use CT (Apodaca et al., 2015; Miller & Rollnick, 2013). Furthermore, research has shown that when clients are given the autonomy to choose what is discussed in sessions and when therapists sincerely demonstrate compassion for the clients' point of view, clients are less likely to get defensive and are more likely to openly explore behavior change (Miller & Rollnick, 2013).

Contrary to expectation and previous research findings, there was a non-significant relationship between MINA therapist behaviors and CT-ST. Behavior counts for the codes classified as MINA were very few, meaning that therapists rarely used MINA behaviors. Therefore, the non-significant finding might be the result of the low frequency and lack of variability of the MINA score. Similarly, contrary to expectations, no relationship was found between MIA and CT-ST. Finding no relationship between MIA and CT-ST was surprising given the body of research evidence that suggests a positive relationship between these variables (Barnett et al., 2014; Moyers & Martin, 2006). One possible explanation for this finding is that the differences between therapists in their use of MIA during the feedback sessions cancelled each other out, resulting in a lack of relationship between the variables when using group therapist means of MIA. To explore whether this explanation was valid, correlations were calculated separately for each therapist. Results of the correlations between MIA and CT-ST by therapist revealed small and non-significant relationships, with Therapist 1's correlations resulting in a positive relationship ( $r = .016$ ), and Therapist 2's and Therapist 4's correlations resulting in a negative relationship ( $r = -.074$  and  $r = -.641$ , respectively). Although these were not

significant relationships, these findings suggest that the complete lack of relationship between MIA and CT-ST was perhaps a result grouping the therapists together.

### **Predicting EA Health Risk Behaviors**

RQ 3a aimed at determining whether MI-adherence and client change language predict EA 1 year post-intervention health risk behaviors. It was hypothesized that higher MI-adherence, higher CT-ST, and higher self-exploration would predict decreases in health risk behaviors above and beyond initial risk status at pre-intervention. Results from the current study only partially support this hypothesis.

**Initial risk.** When examining whether MI-adherence and client change language predicted EA post-intervention health risk behaviors above and beyond initial risk, results indicated that initial risk status across each type of health risk behavior was the greatest predictor of T2 health risk behavior. Specifically, when participants are initially classified as low-risk at T0, they are significantly more likely to have a decrease in health risk behavior at T2, except when predicting marijuana quantity and frequency of condom use. Low initial risk for marijuana quantity predicted increases in marijuana quantity at T2, and initial low-risk condom frequency predicted increases in frequency of sexual intercourse without a condom at T2. Increases in marijuana quantity might be reflective of recent changes in local laws governing the recreational use of cannabis that went into effect in July, 2015 (as data for T2 were collected between 2014-2016). Therefore, it is possible that participants gained easier access to marijuana, which resulted in an increase in marijuana quantity. However, the same phenomenon was not observed for marijuana frequency, which leaves us with uncertainty about this unexpected finding. Increases in sexual intercourse without a condom might be reflective of normative EA development.

For example, as EAs get older, they are more likely to enter into committed relationships with a single partner, rendering the use of condoms less important (Civic, 1999; O’Sullivan, Udell, Montrose, Antonello, & Hoffman, 2010). Additionally, for the purposes of the current study, the author was interested in sexual risk behaviors that could result in adverse health consequences (i.e., STIs); therefore, the use of other forms of contraception were not explored. It is possible that EAs, upon entering a committed relationship, rely on other forms of contraception (e.g., birth control pills) as the risk of contracting an STI is perceived as less threatening.

**MI-adherence.** With regard to MI-adherence, higher therapist technical scores predicted decreases in marijuana frequency and quantity and an increase in condom use but did not predict any other health risk behaviors at T2 above and beyond initial risk. Therapist R:Q also predicted a decrease in marijuana quantity but did not significantly predict any other health risk behaviors at T2 above and beyond initial risk. These results partially support study hypotheses, such that therapist attention to and elicitation of CT (technical skills) and use of a higher ratio of reflections to questions (deepening of exploration of a target change behavior) predicted reductions in marijuana use. Additionally, increases in condom use as a result of therapists use of technical skills suggests that EAs benefit from exploring the risks associated with unprotected sex through non-judgmental interactions aimed at evoking their expertise about the risks of engaging in sexual intercourse without a condom. These are important findings given the prevalence rates of STIs and the spike in marijuana use among this population (Center for Disease Control, 2015; Skidmore et al., 2016).

However, not all facets of MI-adherence demonstrated an influence on T2 behavior change and there was no effect of MI-adherence on alcohol use, which is contrary to expectations. The mean age of participants at T2 was 21 years ( $SD = 0.62$ , range = 20-23). As such, coming of age (reaching the legal age to consume and purchase alcohol) might have played a role in the lack of treatment effects on alcohol use. Study participants are still in a stage of life where normative drinking is generally higher than that of older adults (Miech et al., 2015), and EAs might not experience as much ambivalence about their drinking because at this age it is more socially acceptable. MI techniques are utilized specifically to highlight discrepancies in clients' own arguments for and against behavior change in order to elicit CT (Miller & Rollnick, 2013). Therefore, these alcohol use findings could be indicative of a lack of social consequences and therefore less ambivalence about drinking behaviors in the current sample. Additionally, researchers find that normative alcohol use trajectories begin to level off as EAs approach the mid- to late-20s (Ashen Hurst, Harden, Corbin, & Fromme, 2015). Therefore, it is possible that a change in drinking behaviors will occur naturally as a reflection of personal characteristics (e.g., initial alcohol use behaviors) rather than a reflection of intervention effect. Additionally, it is unclear as to why other measures of MI-adherence were not predictive of health risk behaviors. It is possible that low MI fidelity resulted in non-significant findings. Specifically, two of the therapists did not reach minimum competency benchmarks for relational scores. Furthermore, relational skills are influenced by therapists' use of MIA and MINA. Such that, when therapists use more MIA and avoid MINA, their relational scores increase. Although therapists used MIA more than MINA, the frequency with which MIA was used might not have

counterbalanced the times when MINA was used. As aforementioned, research suggests that avoiding MINA is highly influential in predicting positive client outcomes (Gaume et al., 2009). In contrast, R:Q influences therapists' technical scores because those skills are used to draw out and strengthen CT as well as to soften and reduce ST. With this in mind, and taking into account research suggesting that CT is a causal mechanism of change (e.g., Moyers & Martin, 2006), it is not surprising that R:Q and technical scores were significant predictors in at least a few of the regression models.

**Client change language.** Regarding client change language, higher client self-exploration predicted an increase in both marijuana quantity and number of sexual partners, but did not significantly predict any other health risk behaviors at T2 above and beyond initial risk. CT-ST was predictive of a decrease in marijuana quantity but not predictive of any other health risk behaviors at T2 above and beyond initial risk. These results are only partially supportive of initial hypotheses. We predicted that both self-exploration and CT-ST would predict reductions in health risk behaviors. Self-exploration predicted marijuana quantity and number of sexual partners in the opposite direction than expected. Although this is contrary to the hypothesized relationships, measures of self-exploration were not dependent upon the direction in which clients presented arguments about change. That is, clients who delved deeply into arguments in favor of the status quo would have received an equally high self-exploration score as those who delved deeply into arguments in favor of change because the self-exploration global code measured disclosure of personally relevant material regardless of its relation with the target change behavior.

The finding that CT-ST predicts decreases in T2 marijuana quantity partially supports initial hypotheses. This finding also partially supports explanations listed above about why technical scores predicted decreases in marijuana use and increases in condom use. Given the extensive body of literature indicating CT as a causal mechanism of MI (Moyers & Martin, 2006; Moyers et al., 2009; Smith et al., 2013a), it is surprising that the CT-ST variable was only predictive of one health risk behavior. When coding for CT and ST for the current study, utterances were not flagged or separated by the target change behavior (i.e., health risk behavior). For example, if a client stated, “I hate feeling hung over after drinking,” this statement was coded generically as CT. Therefore, the CT-ST variable could comprise a majority of CT and ST statements about one health risk behavior (e.g., marijuana use), and not take into account any other target change behaviors. Given that alcohol use often co-occurs with other health risk behaviors (Cohn, Johnson, Rath, & Villanti, 2016; Grello et al., 2016), a CT-ST variable made up primarily of utterances about alcohol use might have had more predictive value. Because utterances were not separated by health risk behavior, it is not impossible to determine if higher CT-ST is made up of statements that encompass each of the health risk behaviors that were included in the analyses. However, the fact that CT-ST predicted significant changes in marijuana quantity in the expected direction is a promising finding that highlights the importance of CT. Furthermore, results from the current study indicate that therapists can use specific MI skills to further deepen and increase the frequency with which CT is used during sessions, further highlighting how therapists can support clients in their efforts to make positive changes.

### **Predicting Overall Risk**

RQ 3b aimed to determine whether MI-adherence and client change language predict EA 1 year post-intervention overall risk. It was hypothesized that greater MI fidelity and higher CT-ST and self-exploration would predict lower overall risk at T2. These hypotheses were only partially supported. Analyses demonstrated that T0 overall risk and therapist technical and relational scores were the only significant predictors of T2 overall risk.

**Initial risk.** Zero engagement in risk at T0 predicted lower overall risk at T2. However, engagement in one or more risk behavior at T0 was not predictive of T2 overall risk. These findings suggest that, for the current sample, when individuals participated in high-risk behaviors, they were more likely to maintain similar levels of risk behavior across time points. Additionally, these findings highlight that lower risk behavior initially serves as a protective factor and further demonstrates the need for preventive interventions.

**MI-adherence.** Higher technical scores predicted higher overall risk at T2, and higher relational scores predicted lower overall risk at T2. Whereas, none of the other indicators of MI-adherence significantly predicted T2 overall risk. The relationship between relational scores and overall risk was in the expected direction. This finding supports previous research indicating that empathy and collaboration are important therapist characteristics that influence client outcomes (Norcross & Wampold, 2011). However, it is surprising that higher technical scores predicted higher overall risk. Perhaps relational skills are more important when working with higher risk clients because those skills communicate non-judgment. Individual who engage in more risky behaviors might be more likely to disclose information under conditions in which they



feel heard and accepted, and might be more defensive under and closed-off under conditions in which therapists are trying to focus conversations on argument for change (i.e., using technical skills). Furthermore, as is consistent with the client-centered nature of MI and the FCU, therapists might default to using more relational skills with clients who are higher risk in order to meet the client where they are and increase client engagement. In a previous study on the FCU, such use of relational skills was found to increase client engagement in sessions, and in turn, client engagement mediated improvements in client outcomes (Smith et al., 2013a).

It is uncertain why other indicators of MI-adherence, such as R:Q, MIA, and MINA, were not significant predictors of T2 overall risk. This is especially surprising given that there are significant correlations between relational, MIA, MINA, and R:Q scores, and a significant correlation between technical and MINA scores. Perhaps specific therapist behaviors (i.e., OARS, MINA) play less of a role in change when working with higher risk individuals than therapists' way of being and interacting with clients (MI-spirit).

**Client change language.** Contrary to initial hypotheses, neither of the client change language variables significantly predicted T2 overall risk. Perhaps measures of client change language were too specific to capture the unique exploration of individuals who rank high across a number of different behaviors. Additionally, due to the manner in which feedback is given for the FCU, it is possible that individuals who rank high on more than one behavior are also experiencing challenges in relationships, school/work, and emotional functioning; therefore, therapists might have spent more time talking with EAs about other areas of life that are challenging rather than spending time talking about

specific health risk behaviors. If this is the case, it is possible that few CT and ST utterances were captured because the feedback session was more focused on domains of EA functioning that were not captured by the target behaviors that were identified for coding purposes.

## **Implications**

Overall, results from the current study indicate that FCU therapists are doing a good job of maintaining fidelity to the model through the use of MI techniques. Differences between therapists in MI fidelity suggest that there is a need for more careful monitoring of fidelity. Targeted feedback and coaching in supervision meetings could prove to be useful for further improving treatment integrity and ensuring that implementation of the intervention is consistent across therapists. Monitoring of treatment fidelity over time is recommended to prevent drift from fidelity (Chiapa et al., 2015) and is particularly relevant to the current study, given that data were collected longitudinally. The MITI 4 is a useful tool that therapists can use independently to monitor their treatment fidelity and it can be used as a supervision tool for structuring feedback (Moyers et al., 2014; Moyers et al., 2016). Similarly, it is difficult to say whether MI fidelity accounted for the mixed results that were found when predicting health risk behaviors and overall risk. However, evidence suggests that higher fidelity to both MI and the FCU model significantly predicts improvements in client outcomes (Gaume et al., 2009; Smith et al., 2013b). The FCU intervention, in and of itself, is efficacious at producing positive changes in families and youth, without accounting for specific MI techniques, and the current findings suggest that MI-adherence might be a mechanism of change within the FCU.

The effect of therapist technical scores on client health risk behaviors suggest a potential benefit of therapists' attention to client language, and the use of specific MI skills (i.e., reflections and open-ended questions) could be an area of focus in FCU therapist training, in addition to the focus on case conceptualization, video feedback, and delivery of client-centered assessment-based feedback. Research on the manner in which feedback is given in the FCU, also suggests that attending to the context and needs of the client is important to increasing engagement (Smith et al., 2013a). Current study results support the use of relational skills and demonstrate that among clients who are at high risk or who are engaging in more overall risk than their same-aged peers, empathy and collaboration might be the best approach for helping clients reduce risk. The therapeutic relationship has been found to be a fundamental aspect of therapy and therapist relational skills are core skills for increasing client trust (Miller & Rollnick, 2013). Among high risk clients, trust is even more important and can help facilitate discussions about topics that might otherwise increase client discord.

### **Limitations and Future Directions**

As is true of all research studies, it is important to use caution when interpreting the results in light of study limitations. First, achieving IRR on the MITI 4 proved to be a difficult endeavor. Specifically, the ICC for the technical and MINA scores were within the “moderate” range when using less stringent markers of IRR outlined by Landis and Koch (1977), and within the “fair” range when using the more conservative indicators of IRR outlined by Cicchetti (1994). The ICCs for technical and MINA scores in the current study are lower than those found by Moyers et al. (2016) in a study assessing the preliminary reliability and validity of the MITI 4. However, current study ICCs for the

technical score were comparable to those of the two best coders in the Moyers et al. (2016) study. Additionally, current study ICCs for the relational, R:Q, and MIA scores were higher than those of the two best coders in the Moyers et al. (2016) study. Furthermore, coders in both the current study and the study by Moyers et al. (2016) were unable to reach a satisfactory IRR on the %CR score. Therefore, future research on MITI reliability and validity should consider the use of a total reflection score rather than separating reflections into complex and simple behavior counts. Moreover, the interrelationship between the behavior counts and global codes also brings to question whether global summary scores can be used on their own to represent MI fidelity. For this reason, future studies investigating the validity and reliability of the MITI could consider examining whether it is necessary to include all 5 summary scores in analyses.

Given that the FCU is based on the ecological model, having knowledge of clients' contextual experiences could also improve IRR. In a previous study on FCU fidelity, limitations associated with low IRR on the COACH prompted an investigation on how reliability can be improved by providing coders information on participants' ecological assessments (Smith et al., 2016). Coders who had access to participant information had higher reliability when examining both therapist fidelity to the FCU model and caregiver engagement than those who did not have participant information (Smith et al., 2016). Future studies on FCU treatment fidelity should consider the use of participant information as a way of increasing IRR.

Additionally, coding for the current study involved the use of more than one target behavior. The decision to use more than one target behavior was made in an effort to be consistent with the client-centered nature of MI and the FCU, and in an effort to

capture the depth of client-therapist interactions during the FCU feedback sessions. There are a variety of topics covered in the FCU feedback session (e.g., daily living, relationships, and health risk behaviors), and the target behaviors were identified to capture the subject matter about which participants spoke most (e.g., coping strategies, substance use and sexual behavior, and academic/work success). Moyers et al. (2014) recommend that target behaviors are identified prior to coding, but typically only one target behavior is used. Using more than one target behavior might have made it more difficult to maintain reliability, particularly on the technical score, because coders might have referenced different target behaviors when making decisions about whether a therapist was responding appropriately to client CT and ST. Likewise, as aforementioned, the CLEAR coding did not flag or notate which utterances related to specific target behaviors. Therefore, the measures of CT could be a representation of language that is not generalizable across each of the domains of health risk behavior that were measured in the current study. Future research should identify one primary target behavior as those are the recommendations in the MITI 4 and CLEAR coding manuals (Glynn & Moyers, 2012; Moyers et al., 2014). If more than one target behavior is warranted, delineating what client utterances pertain to specific target behaviors could be useful when running and interpreting analyses.

In addition, significant differences between therapists' MI fidelity could be considered a limitation of the current study. These differences might have accounted for non-significant findings between MI-adherence, client change talk, and outcome variables. Furthermore, differences between therapists could have impacted client outcomes in a manner that was not accounted for in the current study analyses. For

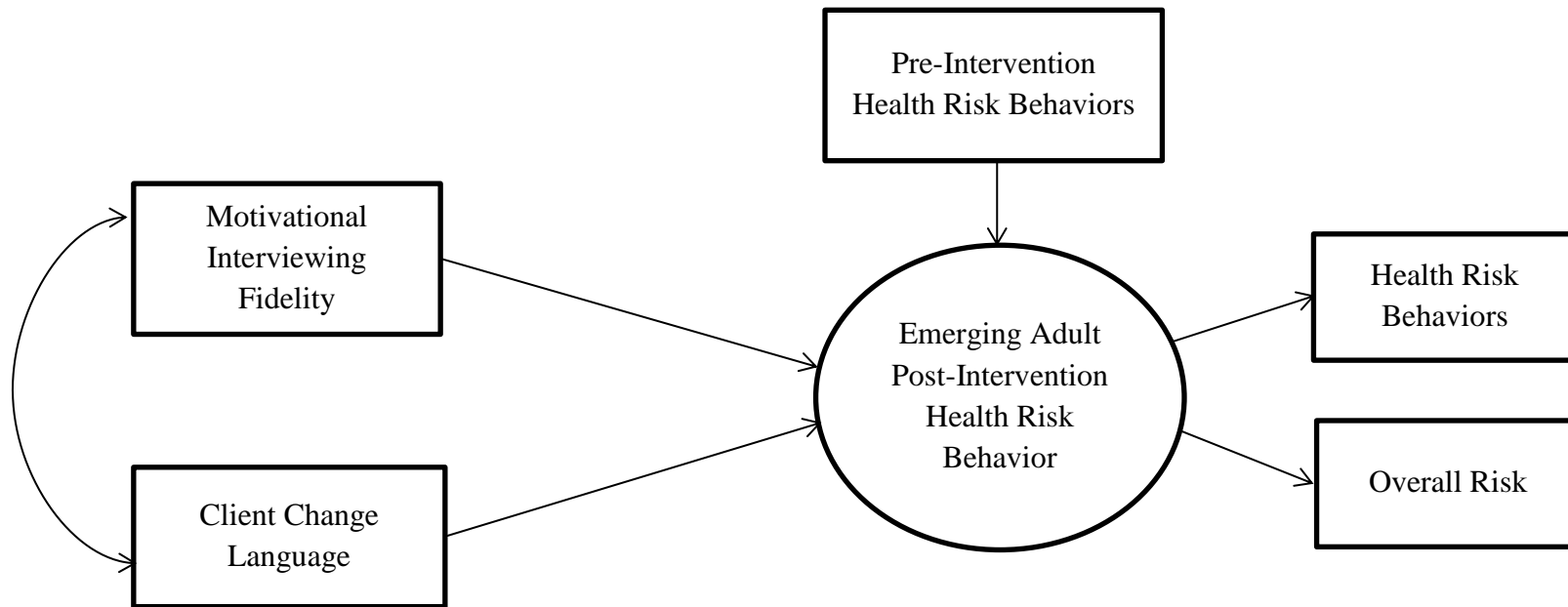
example, therapist characteristics might have accounted for post-intervention changes. Future studies of FCU treatment fidelity should consider examining the data using multilevel modeling (MLM), with clients nested within therapist to determine if there were significant effects of therapist on client outcomes. MLM was not conducted in the current study due to the small sample sizes of FCU feedback sessions for Therapist 2, Therapist 3, and Therapist 4.

Lastly, although power analyses indicated that a sample size of 126 participants is adequate for detecting medium to large effect sizes, a larger sample could be useful. Specifically, the *N*'s for each therapist varied significantly. These differences could have impacted the within-therapist variability of MI fidelity mean scores. A larger sample might result in an improvement in consistency of MI fidelity scores between therapists.

## **Conclusions**

Despite these limitations, the current study adds important information to the current literature base on MI and FCU interventions. This is the first study to evaluate the use of MI within the FCU and to demonstrate significant relationships between specific therapist behaviors and client outcomes. To find significant results from only one therapist session is remarkable and lends important implications for intervening in the lives of EAs. Emerging adulthood is a transitional period that places EAs at an increased risk of engaging in health risk behaviors. The current study provides promising results for a flexible and brief model of intervention that can be tailored to meet the needs of this unique developmental phase. Additionally, the current study is one of two studies to my knowledge to use the most recent iteration of the MITI to measure MI fidelity, and it provides relevant information about coder training and utility of newly added codes for

the prediction of client outcomes. Given that the MITI global codes were predictors of health risk behaviors and overall risk, implications can be made about the use of such measures in future studies as a way to determine therapists' impact on client outcomes.



*Figure 1.* Conceptual model depicting relationship between predictor variables and outcomes.



Table 1

*Summary of Independent and Dependent Variables*

<b>Predictor Variables</b>	
<b>MITI 4 Summary Score</b>	<b>Calculation</b>
Technical Global	$(\text{Cultivating CT} + \text{Softening ST}) / 2$
Relational Global	$(\text{Partnership} + \text{Empathy}) / 2$
Percent Complex Reflections (%CR)	$\text{CR} / (\text{SR} + \text{CR})$
Reflection-to- Question Ratio (R:Q)	Total reflections / Total Questions
Total MI- Adherent (MIA)	Seeking Collaboration + Affirm + Emphasizing Autonomy
Total MI Non- Adherent (MINA)	Confront + Persuade

**Client  
Change  
Language  
Self-  
Exploration**

CT-ST      CLEAR change talk behavior counts – CLEAR sustain talk behavior counts

Outcome Variables	
Continuous Variables (T0 & T2)	Calculation
<b>Health Risk Behaviors</b>	
Alcohol Frequency	$\frac{(\text{"How often did you drink beer in the last 3 months?"} + \text{"... drink malt liquor ...?"} + \text{"... drink hard liquor ...?"})}{3}$
Alcohol Quantity	"When you drank beer in the last 3 months, how much did you usually drink?" + "... malt liquor ...?" + "...hard liquor...?"
Marijuana Frequency	"How often did you use marijuana in the last 3 months?"
Marijuana Quantity	"When using marijuana, how much did you usually smoke?"

Number of Sexual Partners	“Altogether during the last three months how many different people of the opposite sex have you had as sexual partners?”
---------------------------	--

Frequency of Condom Use	“In the last three months, how many people of the opposite sex have you had sex with and not used a condom?”
-------------------------	--

---

<b>Categorical Variables (T0 &amp; T2)</b>	<b>Calculation</b>
--	--------------------

---

**Dichotomous Risk Group**

Alcohol Frequency Risk	0 = participants whose mean alcohol frequency score was 3 (once every 2-3 weeks) or lower, 1 = participants whose mean alcohol frequency score was 4 (once a week) or higher
Alcohol Quantity Risk	0 = participants whose sum of alcohol quantity score was 3 (3 standard drinks per occasion) or lower, 1 = participants whose sum of alcohol quantity score was 4 (4-5 standard drinks) or higher
Marijuana Frequency Risk	0 = participants who reported a 3 (marijuana use once every 2-3 weeks over past 3 months) or lower, 1 = participants who reported a 4 (marijuana use once a week) or higher
Marijuana Quantity Risk	0 = participants who reported a 3 (one bowl/joint per marijuana use occasion) or lower, 1 = participants who reported a 4 (two bowls/joints per marijuana use occasions) or higher
Sexual Partner Risk	0 = participants who reported 2 or fewer different sexual partners over the past 3 months, 1 = participants who reported 3 or more different sexual partners over the past 3 months

Condom	0 = participants who reported zero occurrences of sexual intercourse without a condom over the past 3 months,
Frequency	1 = participants who reported one or more occurrences of sexual intercourse without a condom over the past 3
Risk	months

### **Overall Risk**

Overall Risk

Variable (T0

& T2)  $\frac{\text{Alcohol Quantity Risk} + \text{Marijuana Frequency Risk} + \text{Sexual Partner Risk}}{3}$

---

*Note.* T0 = pre-intervention, T2 = post-intervention, MITI = Motivational Interviewing Treatment Integrity coding system, CT = change talk, ST = sustain talk, CR = complex reflections, SR = simple reflections, CLEAR = Client Language Easy Rating Scale. The Percent Complex Reflections variable was excluded from analyses due to low interrater reliability

Table 2

*MITI 4 Clinician Basic Competence and Proficiency Thresholds*

	<b>Fair</b>	<b>Good</b>
Technical	3.0	4.0
Relational	3.5	4.0
% CR	40%	50%
R:Q	1:1	2:1
Total MIA	-	-
Total MINA	-	-

*Note.* % CR = Percentage of complex reflections, R:Q = Ratio of reflections to questions, MIA = Motivational Interviewing-adherent, MINA = Motivational Interviewing Non-adherent.

Table 3

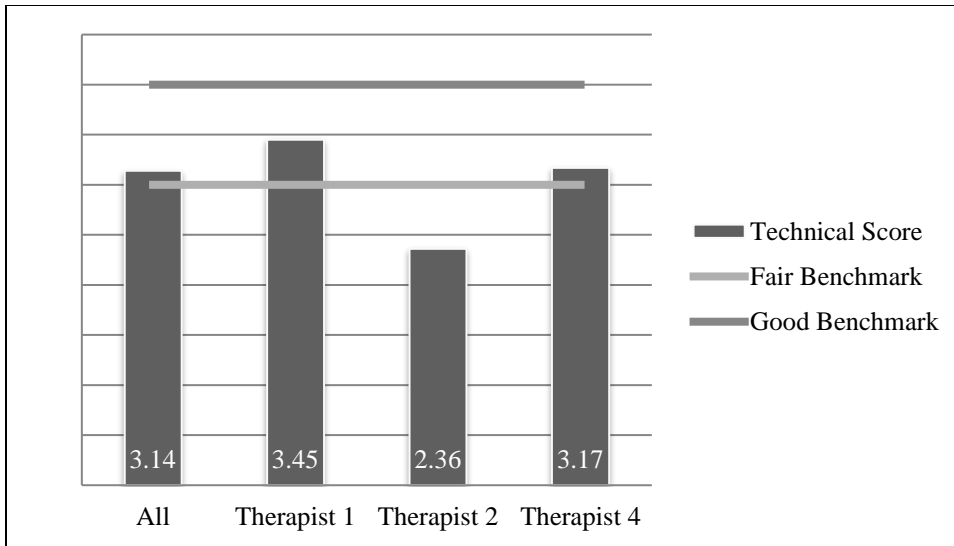
*Intraclass Correlation Results for 20% of Therapist and Client Coded Feedback Sessions.*

<b>MITI 4</b>	<b>Technical</b>	<b>Relational</b>	<b>% CR</b>	<b>R:Q</b>	<b>MIA</b>	<b>MINA</b>
<b>Coder 1</b>	0.51	0.79	0.30	0.91	0.82	0.56

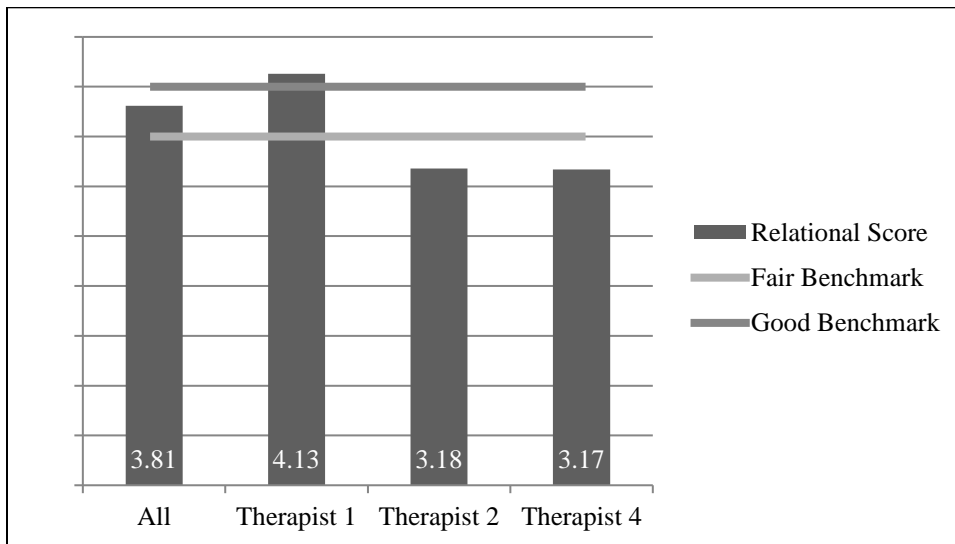
  

<b>CLEAR/MISC 2.1</b>	<b>Self- Exploration</b>	<b>ST</b>	<b>CT</b>
<b>Coder 1</b>	0.66	0.94	0.83
<b>Coder 2</b>	0.75	0.97	0.85
<b>Coder 3</b>	0.94	0.98	0.95

*Note.* Intraclass correlations were conducted with the author servings as the expert to which coders were compared for reliability. MITI 4 = Motivational Interviewing Treatment Integrity version 4, %CR = percentage of complex reflections, R:Q = ratio of reflections to questions, MIA = Motivational Interviewing-adherent, MINA = Motivational Interviewing Non-adherent, CLEAR = Client Language Easy Rating Scale, MISC 2.1 = Motivational Interviewing Skills Code version 2.1, ST = Sustain Talk, CT = Change Talk. % CR did not meet cutoffs for interrater reliability and was excluded from analyses.

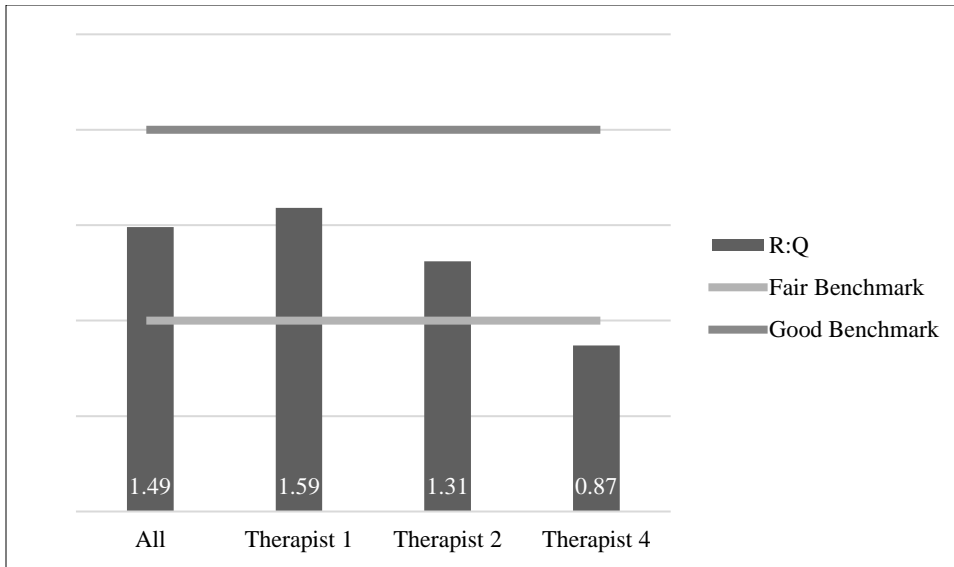


*Figure 2.* Group and individual means for therapist technical scores. Benchmarks of Motivational Interviewing fidelity are indicated with horizontal lines.

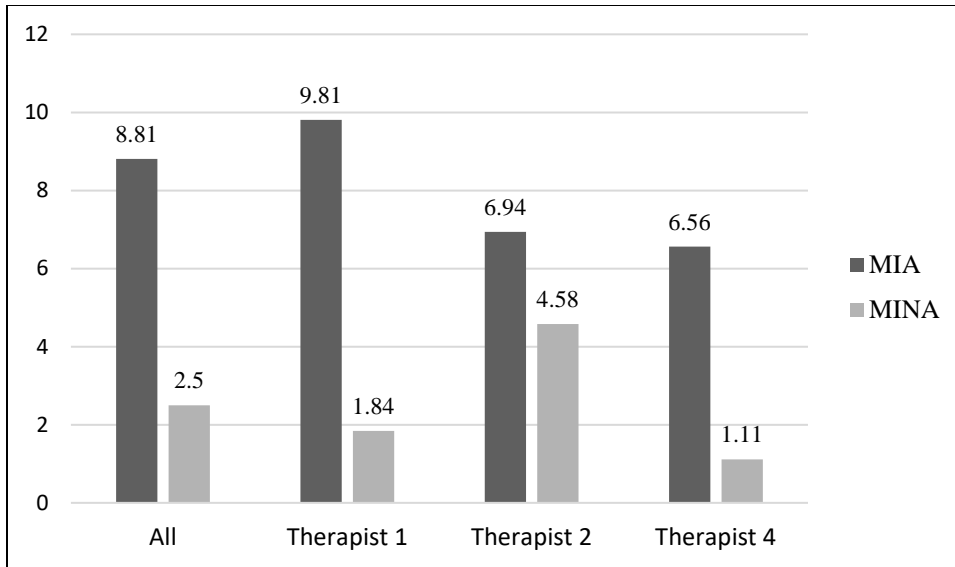


*Figure 3.* Group and individual means for therapist relational scores. Benchmarks of Motivational Interviewing fidelity are indicated with horizontal lines.





*Figure 4.* Group and individual means for therapist ratio of reflections to questions (R:Q) scores. Benchmarks of Motivational Interviewing fidelity are indicated with horizontal lines.



*Figure 5.* Group and individual therapist means for total MI-adherent (MIA) and MI non-adherent (MINA) scores.

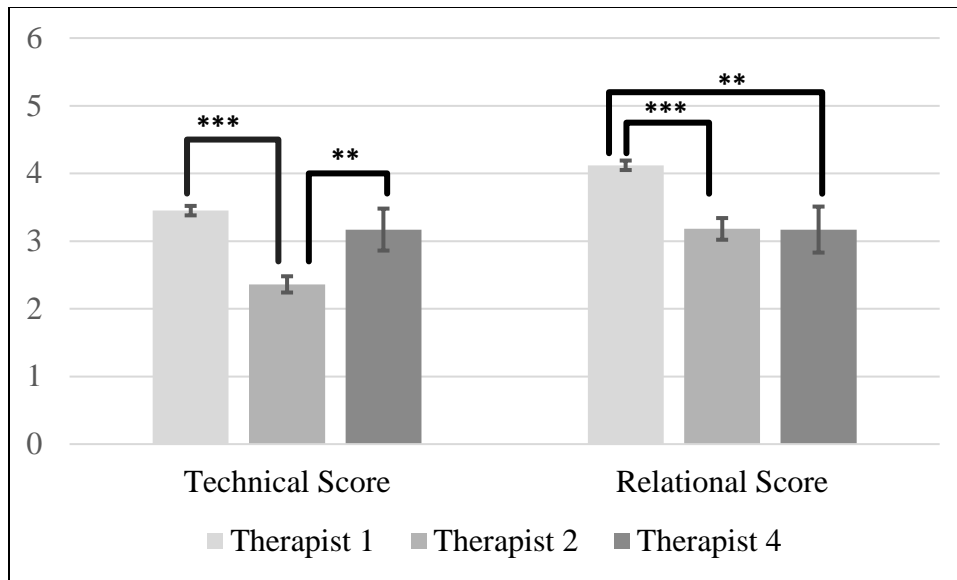
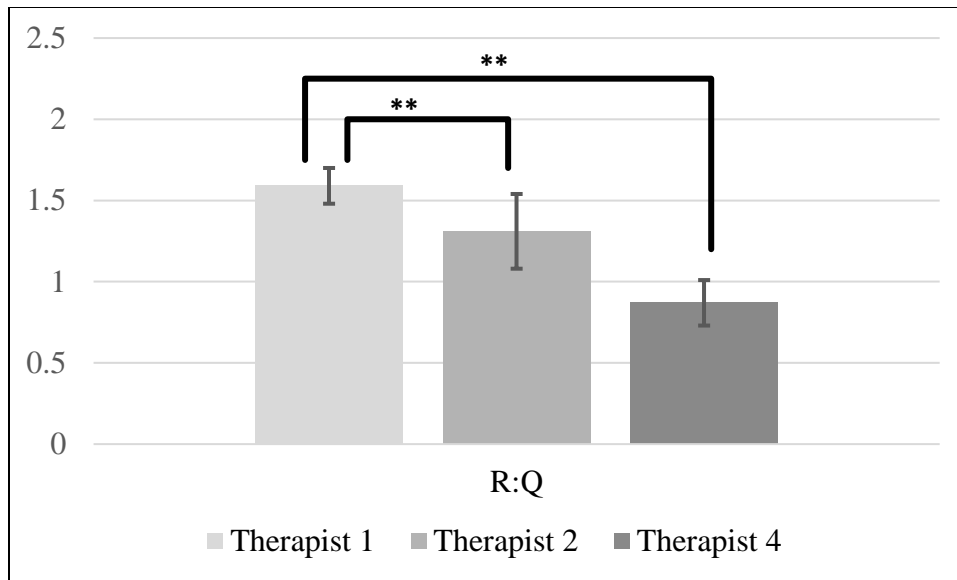
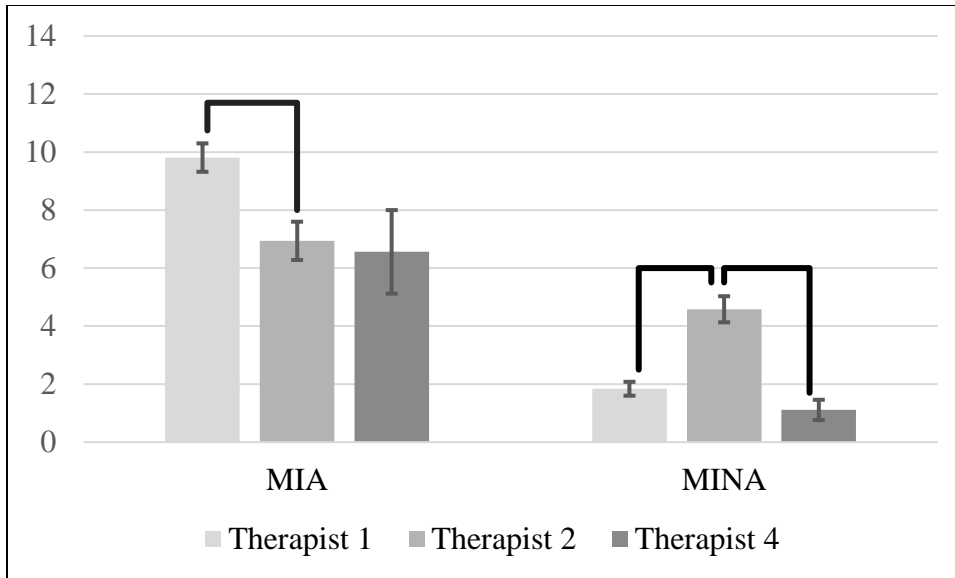


Figure 6. Between-therapist comparisons of MITI 4 global summary scores. Significance for the relational scores is based on non-parametric tests. However, for ease of interpretation, the ratios are shown using therapist means rather than mean ranks.  $**p < .01$ ,  $***p < .001$ .



*Figure 7.* Between-therapist comparisons of MITI 4 ratio of reflections to question (R:Q) summary scores. Significance is based on non-parametric tests. However, for ease of interpretation, the ratios are shown using therapist means rather than mean ranks.  $**p < .01$ ,  $***p < .001$ .



*Figure 8.* Between-therapist comparisons of MITI 4 MI-adherent (MIA) and MI non-adherent (MINA) summary scores. Significance for MINA scores is based on non-parametric tests. However, for ease of interpretation, the ratios are shown using therapist means rather than mean ranks.  $**p < .01$ ,  $***p < .001$ .

Table 4

*Therapist MI-Adherent Variables and Client Change Language Correlations (N = 126).*

Measures	1	2	3	4	5	6 <sup>a</sup>
<b>1. CT-ST</b>	--					
<b>2. Self-Exploration</b>	.21*	--				
<b>3. Technical</b>	.21*	.07	--			
<b>4. Relational</b>	.23*	.16	.61**	--		
<b>5. MIA</b>	.00	-.16	.17	.20*	--	
<b>6. MINA <sup>a</sup></b>	-.14	-.10	-.38**	-.46**	-.05	--
<b>7. R:Q <sup>a</sup></b>	.35**	.06	.17	.25**	-.08	-.14

*Note.* <sup>a</sup> Spearman's rho ( $r_s$ ) correlation coefficients. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Table 5

*Poisson and Negative Binomial Regressions Predicting Post-Intervention Emerging Adult Health Risk Behavior*

Variable/Category	Health Risk Behavior $\beta$ (SE)					
	Alcohol Frequency <sup>1</sup>	Alcohol Quantity <sup>2</sup>	Marijuana Frequency <sup>2</sup>	Marijuana Quantity <sup>2</sup>	Number of Sexual Partners <sup>1</sup>	Frequency of Condom Use <sup>1</sup>
Risk Group						
Low-risk (0)	<b>-0.70 (0.18)</b>	<b>-0.94 (0.21)</b>	<b>-0.92 (0.25)</b>	<b>1.33 (0.29)</b>	<b>-1.19 (0.26)</b>	<b>0.66 (0.20)</b>
High-risk (1)	-	-	-	-	-	-
Technical	-0.16 (0.11)	-0.23 (0.17)	<b>-0.39 (0.19)</b>	<b>-0.49 (0.23)</b>	-0.11 (0.15)	<b>-0.36 (0.16)</b>
Relational	0.20 (0.12)	0.15 (0.17)	0.09 (0.20)	0.16 (0.23)	0.11 (0.15)	0.25 (0.16)
R:Q	-0.02 (0.06)	0.00 (0.10)	-0.16 (0.13)	<b>-0.46 (0.18)</b>	-0.01 (0.09)	0.06 (0.08)
MIA	-0.02 (0.02)	-0.01 (0.03)	0.00 (0.03)	-0.02 (0.03)	-0.01 (0.02)	0.02 (0.02)
MINA	-0.01 (0.03)	-0.05 (0.05)	-0.02 (0.06)	0.02 (0.05)	-0.06 (0.04)	0.03 (0.04)
Self-exploration	0.06 (0.08)	-0.02 (0.11)	0.20 (0.12)	<b>0.29 (0.14)</b>	<b>0.38 (0.11)</b>	-0.00 (0.10)
CT-ST	-0.01 (0.00)	-0.00 (0.01)	0.00 (0.01)	<b>-0.02 (0.01)</b>	-0.00 (0.01)	0.00 (0.01)
Likelihood ratio $\chi^2$	<b>24.93</b>	<b>24.74</b>	<b>24.42</b>	<b>38.41</b>	<b>29.20</b>	<b>17.41</b>
Degrees of Freedom	8	8	8	8	8	8
Number of cases	126	126	126	126	126	126

*Note.* Risk group represents the risk group variable that was computed individually for each of the health risk behaviors; alcohol frequency risk, alcohol quantity risk, marijuana frequency risk, marijuana quantity risk, sexual partner risk, and condom use frequency risk. R:Q = ratio of reflections to questions, MIA = Motivational Interviewing-adherent, MINA = Motivational Interviewing Non-adherent, CT-ST = change talk minus sustain talk. <sup>1</sup> Poisson regression. <sup>2</sup> Negative binomial regression. Numbers in bold have a  $p < .05$ .

Table 6

*Ordinal Regression Predicting Post-Intervention Emerging Adult Overall Risk*

	$\beta$	SE	95% Confidence Interval	
T0 Overall Risk				
0	<b>-2.70</b>	<b>0.93</b>	<b>-4.53</b>	<b>-0.87</b>
1	-1.00	0.85	-2.67	0.67
2	0.01	0.92	-1.79	1.81
3	-	-	-	-
Technical	<b>0.64</b>	<b>0.28</b>	<b>0.87</b>	<b>1.18</b>
Relational	<b>-0.86</b>	<b>0.28</b>	<b>-1.43</b>	<b>-0.30</b>
R:Q	-0.12	0.16	-0.44	0.20
MIA	-0.03	0.04	-0.11	0.05
MINA	-0.15	0.08	-0.30	0.01
Self-exploration	0.28	0.19	-0.09	0.65
CT-ST	0.01	0.01	-0.00	0.03

*Note.* R:Q = ratio of reflections to questions, MIA = Motivational Interviewing-adherent, MINA = Motivational Interviewing Non-adherent, CT-ST = change talk minus sustain talk. Numbers in bold have a  $p < .05$ .



## APPENDIX A

### COACH

#### EVERYDAY PARENTING (EDP) COACH Rating Form, Version 4

Interventionist ID: \_\_\_\_\_ Family ID: \_\_\_\_\_ TC Age: \_\_\_\_\_ Session Type: \_\_\_\_\_ Segment Time: \_\_\_\_\_ Rater ID: \_\_\_\_\_ Date: \_\_\_\_\_

Excellent work			Competent work			Needs work		
9	8	7	6	5	4	3	2	1

<b>Conceptually accurate in the FCU model</b>		
<input type="checkbox"/> Follows EDP curriculum in structure and content of session. Shows understanding of behaviorally oriented parenting interventions <input type="checkbox"/> Focuses session on FM skill identified in the EDP curriculum <input type="checkbox"/> Briefly links assessment to focus of EDP session	<input type="checkbox"/> Avoids a direct discussion of parenting practices identified in EDP <input type="checkbox"/> Delves into tangents or engages in speculations that detract from EDP <input type="checkbox"/> Presents an interpretation or makes suggestions that are not evidence-based.	<input type="checkbox"/>
<b>Observant and responsive to client's context and needs</b>		
<input type="checkbox"/> Queries and/or attends to clients emotional state during the session <input type="checkbox"/> Tailors session to client's education, emotional needs, or cultural background <input type="checkbox"/> Language and examples used are those of the client and reflect the family storyline <input type="checkbox"/> Tailors and/or adjusts session to address client's immediate concerns and context	<input type="checkbox"/> Doesn't provide client with opportunities for input or adjustments. <input type="checkbox"/> Lectures, steam rolls, disproportionate therapist/client talk ratio (Goal is 50-50) <input type="checkbox"/> Misses potential issues related to harm reduction or immediate action	<input type="checkbox"/>
<b>Actively structures sessions to optimize effectiveness</b>		
<input type="checkbox"/> Begins with re establishing collaborative set for focus of session <input type="checkbox"/> Manages presentation of EDP material to optimize client engagement <input type="checkbox"/> Is prepared and uses materials appropriately (e.g., videos, handouts, white board) <input type="checkbox"/> Structures sessions to allow client opportunities to respond and react	<input type="checkbox"/> Mismanages time, session too long or significant sections of session unrealized <input type="checkbox"/> Session disjointed; needs better pacing, transitions, and time for instruction <input type="checkbox"/> Session structure disrupts clients potential to 'get' personally engage with EDP.	<input type="checkbox"/>
<b>Carefully teaches and provides corrective feedback</b>		
<input type="checkbox"/> Tailors session to build's on clients abilities, efforts, insights and strengths <input type="checkbox"/> Connects the dots between the client's earlier reports, assessment and session <input type="checkbox"/> Uses rationales and 'raps' that are consistent with EDP curriculum <input type="checkbox"/> Skillfully engages client in relevant role plays and exercises that are skill building	<input type="checkbox"/> Focuses on a EDP session that is not appropriate for this client <input type="checkbox"/> Provides rationales or advice this is unscientific, or unprofessional. <input type="checkbox"/> Teaches too much in feedback session (i.e., lecturing, too much information)	<input type="checkbox"/>
<b>Hope and Motivation</b>		
<input type="checkbox"/> Prompts, evokes and supports client's "change talk" during EDP session. <input type="checkbox"/> Collaborative exploration and troubleshooting of problems use of new skill <input type="checkbox"/> Supports self-efficacy by identifying realistic goals with achievable steps <input type="checkbox"/> Uses questions, validation and support to manage client discord and ambivalence in service of change (rolls with resistance)	<input type="checkbox"/> Missed opportunities to highlight past client efforts, successes, or strengths <input type="checkbox"/> Advice giving, disagreement or teaching in the face of ambivalence or discord <input type="checkbox"/> Either by words or activities, undermines the clients feeling of self-efficacy	<input type="checkbox"/>
<b>Client Engagement</b>		
<input type="checkbox"/> Actively participates, nods head and stays on topic <input type="checkbox"/> Gives thoughtful responses to therapist's questions; demonstrates understanding <input type="checkbox"/> Engages in "change talk" by reflecting on the past and future <input type="checkbox"/> Engages in session activities such as role plays and exercises	<input type="checkbox"/> Angry, actively challenges or defensive during EDP session <input type="checkbox"/> Does not share information, and is not open about family life <input type="checkbox"/> Seems unconcerned about parenting and/or child	<div>PC</div> <input type="checkbox"/> <div>AC</div> <input type="checkbox"/>

Technical difficulties/notes:

**APPENDIX B**  
**MITI CODING MANUAL**

Motivational Interviewing Treatment Integrity  
Coding Manual 4.2.1

T.B. Moyers<sup>1</sup>, J.K. Manuel<sup>2</sup>, & D. Ernst<sup>3</sup>  
University of New Mexico

<sup>1</sup>Center on Alcoholism, Substance Abuse, and Addictions (CASAA)

<sup>2</sup>Department of Veterans Affairs

<sup>3</sup>Denise Ernst Training & Consultation

Recommended citation:

Moyers, T.B., Manuel, J.K., & Ernst, D. (2014). *Motivational Interviewing Treatment Integrity Coding Manual 4.1*. Unpublished manual.

We are grateful to the following editors of this manual:

Lisa Hagen Glynn

Christiana Fortini

## Revisions for 4.1

Text change in Persuade with Permission to clarify the length and extent of permission

Correction of formatting errors

Revision of examples

## Revisions for 4.2

### A. Sustain Talk

Added sentence to Softening Sustain Talk global indicating that therapists may receive high scores on this scale even if no sustain talk is present in the session. Also added this point as FAQ # 6.

Added FAQ to elaborate on use of sustain talk to build empathy and how this might be reflected in scoring for Softening Sustain Talk (FAQ #7)

Added FAQ to elaborate on how Softening Sustain Talk should be scored in decisional balance exercise (FAQ #8)

### B. Change Talk

Added sentence to Cultivating Change Talk indicating that clinicians should not be penalized if clients do not offer change talk despite their efforts.

### C. Seeking Collaboration

Added sentence to indicate that Seek Collaboration code need not be assigned when therapists are querying client's intellectual grasp of their statements (FAQ #9)

## **A. INTRODUCTION TO THE MITI**

### ***Purpose of the MITI***

How well or poorly is a clinician using motivational interviewing? The MITI is a behavioral coding system that provides an answer to this question. The MITI also yields feedback that can be used to increase clinical skill in the practice of motivational interviewing. The MITI is intended to be used as a:

- 1) Treatment integrity measure for clinical trials of motivational interviewing.
- 2) Means of providing structured, formal feedback about ways to improve practice in non-research settings.
- 3) Component of selection criteria for training and hiring (for more information about this, see the FAQ section in Appendix B; in progress).

The MITI evaluates component processes within motivational interviewing, including engaging, focusing, evoking, and planning. Sessions without a specific change target or goal may not be appropriate for evaluation with the MITI (see Designating a Change Goal; Section C), although some of the elements may be useful for evaluating and giving feedback about engaging skills.

## **B. COMPONENTS OF THE MITI**

The MITI has two components: the global scores and the behavior counts.

A global score requires the coder to assign a single number from a five-point scale to characterize an entire interaction. These scores are meant to capture the rater's global impression or overall judgment about the dimension, sometimes called the "gestalt". Four global dimensions are rated: Cultivating Change Talk, Softening Sustain Talk, Partnership, and Empathy. This means that each MITI review will contain four global scores.

A behavior count requires the coder to tally instances of particular interviewer behaviors. These running tallies occur from the beginning of the segment being reviewed until the end. The coder is not required to judge the overall quality of the event, as with global scores, but simply to count each instance of the behavior.

Typically, both the global scores and behavior counts are assessed within a single review of the audio recording. A random 20-minute segment is the recommended duration for a coding sample. Shorter or longer segments may be used, but caution is warranted in assigning and interpreting global scores for longer or shorter samples. Careful attention should be paid to ensure that the sampling of the segments is truly random, especially within clinical trials, so that proper inferences about the overall integrity of the MI intervention can be drawn.

The recording may be stopped as needed, but excessive stopping and restarting during actual coding (as opposed to training or group review) may disrupt the ability of the coder to form a gestalt impression needed for the global codes. Coders may therefore decide to use two passes through the recording until they are proficient in using the coding system. In that case, the first pass should be used for the global scores and the second for the behavior counts.

### **C. DESIGNATING A CHANGE GOAL**

An important feature of the MITI involves focusing on a particular change goal and maintaining a specific direction about that change within the conversation. Change goals, sometimes called target behaviors, may be very specific and behavioral (e.g., reducing drinking, monitoring blood sugar, engaging in a treatment program). *Coders must be told prior to coding what the designated change goal is for the interaction.* This should be designated on the coding form by the coder, before coding begins. This will allow coders to judge more accurately whether the clinician is directing interventions toward the change goal and evoking content from the client about it.

### **D. GLOBAL SCORES**

Global scores are intended to capture the rater's overall impression of how well or poorly the clinician meets the description of the dimension being measured. Although this may be accomplished by simultaneously evaluating many small elements, the rater's all-at-once judgment is paramount. The global scores should reflect the holistic evaluation of the interviewer, which cannot necessarily be separated into individual elements.

Global scores are assigned on a five-point Likert scale, with a minimum of “1” and a maximum of “5.” The coder assumes a default score of “3” and moves up or down as indicated. A “3” may also reflect mixed practice. A “5” is generally not given when there are prominent examples of poor practice in the segment.

<b>Cultivating Change Talk</b>				
Low			High	
1	2	3	4	5
Clinician shows no explicit attention to, or preference for, the client’s language in favor of changing	Clinician sporadically attends to client language in favor of change – frequently misses opportunities to encourage change talk	Clinician often attends to the client’s language in favor of change, but misses some opportunities to encourage change talk	Clinician consistently attends to the client’s language about change and makes efforts to encourage it	Clinician shows a marked and consistent effort to increase the depth, strength, or momentum of the client’s language in favor of change

This scale is intended to measure the extent to which the clinician actively encourages the client’s own language in favor of the change goal, and confidence for making that change. To achieve higher ratings on the Cultivating Change Talk scale, the change goal must be obvious in the session and the conversation must be largely focused on change, with the clinician actively cultivating change talk when possible. Low scores on this scale occur when the clinician is inattentive to the client’s language about change, either by failing to recognize and follow up on it, or by prioritizing other aspects of the interaction (such as history-taking, assessment or non-directive listening). Interactions low in Cultivating Change Talk may still be highly empathic and clinically appropriate.

Care should be taken not to penalize clinicians if clients do not offer change talk or do not respond to efforts to evoke it.

#### *Verbal Anchors*

1. Clinician shows no explicit attention to, or preference for, the client’s language in favor of changing.

Examples:

- Asks only for a history of the problem
- Structures the conversation to focus only on the problems the client is experiencing
- Shows no interest or concern for client values, strengths, hopes or past successes
- Provides education as only interaction with the client
- Supplies reasons for change rather than encouraging them from the client
- Ignores change talk when it is offered

2. Clinician sporadically attends to client language in favor of change – frequently misses opportunities to encourage change talk.

Examples:

- Superficial attention to client language about the change goal
- Fails to ask about potential benefits of change
- Lack of curiosity or minimal interest in client's values, strengths and past successes

3. Clinician often attends to the client's language in favor of change, but misses some opportunities to encourage change talk.

Examples:

- Misses opportunities to encourage client language in favor of change
- May give equal time and attention to sustain talk and change talk, for example using decisional balance after momentum for change is emerging

4. Clinician consistently attends to the client's language about change and makes efforts to encourage it.

Examples:

- More often than not, acknowledges client reasons for change and explores when they are offered
- Often responds to change talk with reflections that do not encourage deeper exploration from the client
- Expresses curiosity when clients offer change talk
- May explore client's values, strengths, hopes and past successes related to target goal

5. Clinician shows a *marked and consistent* effort to increase the depth, strength, or momentum of the client's language in favor of change.

Examples:

- Over a series of exchanges, the clinician shapes the client's language in favor of change
- Uses structured therapeutic tasks as a way of eliciting and reinforcing change talk
- Does not usually miss opportunities to explore more deeply when client offers change talk
- Strategically elicits change talk and consistently responds to it when offered
- Rarely misses opportunities to build momentum of change talk

Softening Sustain Talk				
Low			High	
1	2	3	4	5
Clinician consistently responds to the client's language in a manner that facilitates the frequency or depth of arguments in favor of the status quo.	Clinician usually chooses to explore, focus on, or respond to the client's language in favor of the status quo.	Clinician gives preference to the client's language in favor of the status quo, but may show some instances of shifting the focus away from sustain talk.	Clinician typically avoids an emphasis on client language favoring the status quo.	Clinician shows a marked and consistent effort to decrease the depth, strength, or momentum of the client's language in favor of the status quo.

This scale is intended to measure the extent that the clinician avoids a focus on the reasons against changing or for maintaining the status quo. To achieve high scores, clinicians should avoid lingering in discussions concerning the difficulty or undesirability of change. Although therapists will sometimes choose to attend to sustain talk to build rapport, in general they should spend only as much time as needed to bring the discussion into more favorable territory for building motivation. High scores may also be achieved in the *absence* of sustain talk during a session, if the clinician does not engage in behaviors to evoke it. Low scores in Softening Sustain Talk are appropriate when clinicians focus considerable attention to the barriers of change, even when using MI-consistent techniques (e.g., asking open questions, offers reflections, affirmations and other MI Adherent techniques) to evoke and reflect sustain talk throughout the session.

1. Clinician consistently responds to the client's language in a manner that facilitates the frequency or depth of arguments in favor of the status quo.



Examples:

- Explicitly asks for arguments against change, queries difficulties
- Actively seeks elaboration when sustain talk is offered through questions, reflections, or affirmations
- Preferential attention and reinforcement of sustain talk when it occurs alongside change talk
- Sustained curiosity and focus about reasons not change

2. Usually chooses to explore, focus on, or respond to client's reasons to maintain the status quo.

Examples:

- Often deepens discussion of barriers or difficulties of change when client mentions them
- Asks about barriers to change on more than one occasion during the interview, even if the client does not bring up
- Often reflects benefits of the status quo

3. Clinician gives preference to the client's language in favor of the status quo, but may show some instances of shifting the focus away from sustain talk.

Examples:

- Some missed opportunities to shift focus away from sustain talk
- Attends to benefits of status quo even when client offers change talk

4. Clinician typically avoids an emphasis on client language favoring the status quo.

Examples:

- Does not explicitly ask for reasons not to change
- Minimal attention to sustain talk when it occurs
- Does not seek elaboration of sustain talk
- Lack of curiosity and focus on client's reasons to maintain the status quo
- Does not linger in discussions about barriers to change

5. Clinician shows a *marked and consistent* effort to decrease the depth, strength, or momentum of the client's language in favor of the status quo.

Examples:

- uses structured therapeutic task(s) to shift the focus of sustain talk toward the target change goal

- may use double-sided reflections (ending with a reflection of change talk) to move the conversation away from sustain talk

<b>Partnership</b>				
Low			High	
1	2	3	4	5
Clinician actively assumes the expert role for the majority of the interaction with the client. Collaboration or partnership is absent.	Clinician superficially responds to opportunities to collaborate.	Clinician incorporates client's contributions but does so in a lukewarm or erratic fashion.	Clinician fosters collaboration and power sharing so that client's contributions impact the session in ways that they otherwise would not.	Clinician actively fosters and encourages power sharing in the interaction in such a way that client's contributions substantially influence the nature of the session.

This scale is intended to measure the extent to which the clinician conveys an understanding that expertise and wisdom about change reside mostly within the client. Clinicians high on this scale behave as if the interview is occurring between two equal partners, both of whom have knowledge that might be useful in solving the change under consideration. Clinicians low on the scale assume the expert role for a majority of the interaction and have a high degree of influence in the nature of the interaction.

#### *Verbal Anchors*

1. Clinician actively assumes the expert role for the majority of the interaction with the client. Collaboration or partnership is absent.

#### *Examples:*

- Explicitly takes the expert role by defining the problem, prescribing the goals, or laying out the plan of action
- Clinician actively forces a particular agenda for the majority of the interaction with the client
- Denies or minimizes client ideas
- Dominates conversation
- Argues when client offers alternative approach
- Often exhibits the righting reflex

2. Clinician superficially responds to opportunities to collaborate.

Examples:

- Clinician rarely surrenders the expert role
- Minimal or superficial querying of client input
- Often sacrifices opportunities for mutual problem solving in favor of supplying knowledge or expertise
- Minimal or superficial responses to client's potential agenda items, knowledge, idea, and /or concerns
- Occasionally may correct the client or refutes what the client has said

3. Clinician incorporates client's contributions but does so in a lukewarm or erratic fashion.

Examples:

- May take advantage of opportunities to collaborate, but does not structure interaction to solicit this
- Misses some opportunities to collaborate when initiated by the client
- The righting reflex is largely absent
- Sacrifices some opportunities for mutual problem solving in favor of supplying knowledge or advice
- Seems to be in a stand-off with the client; not wrestling and not dancing

4. Clinician fosters collaboration and power sharing so that client's contributions impact the session in ways that they otherwise would not.

Examples:

- Some structuring of session to ensure client input
- Searches for agreement on problem definition, agenda setting, and goal setting
- Solicits client views in more than a perfunctory fashion
- Engages client in problem solving or brainstorming
- Does not attempt to educate or direct if client "pushes back" with sustain talk
- Does not insist on resolution unless client is ready

5. Clinician actively fosters and encourages power sharing in the interaction in such a way that client's contributions substantially influence the nature of the session.

Examples:

- Genuinely negotiates the agenda and goals for the session
- Indicates curiosity about client ideas through querying and listening
- Facilitates client evaluation of options and planning
- Explicitly identifies client as the expert and decision maker

- Tempers advice giving and expertise depending on client input
- Clinician favors discussion of client's strengths and resources rather than probing for deficits

Empathy				
Low			High	
1	2	3	4	5
Clinician gives little or no attention to the client's perspective.	Clinician makes sporadic efforts to explore the client's perspective. Clinician's understanding may be inaccurate or may detract from the client's true meaning.	Clinician is actively trying to understand the client's perspective, with modest success.	Clinician makes active and repeated efforts to understand the client's point of view. Shows evidence of accurate understanding of the client's worldview, although mostly limited to explicit content.	Clinician shows evidence of deep understanding of client's point of view, not just for what has been explicitly stated but what the client means but has not yet said.

This scale measures the extent to which the clinician understands or makes an effort to grasp the client's perspective and experience (i.e., how much the clinician attempts to "try on" what the client feels or thinks). Empathy should not be confused with sympathy, warmth, acceptance, genuineness, support, or client advocacy; these are independent of the Empathy rating. Reflective listening is an important part of this characteristic, but this global rating is intended to capture *all efforts* that the clinician makes to understand the client's perspective and convey that understanding to the client.

Clinicians high on the Empathy scale show evidence of understanding the client's worldview in a variety of ways including complex reflections that seem to anticipate what clients mean but have not said, insightful questions based on previous listening and accurate appreciation for the client's emotional state. Clinicians low on the Empathy scale do not appear interested in the client's viewpoint.

#### *Verbal Anchors*

1. Clinician gives little or no attention to the client's perspective.

Examples:

- Asking only information-seeking questions
- Probing for factual information with no attempt to understand the client's perspective

2. Clinician makes sporadic efforts to explore the client's perspective. Clinician's understanding may be inaccurate or may detract from the client's true meaning.

Examples:

- Offers reflections but they often misinterpret what the client had said
- Displays shallow attempts to understand the client

3. Clinician is actively trying to understand the client's perspective, with modest success.

Examples:

- May offer a few accurate reflections, but may miss the client's point
- Makes an attempt to grasp the client's meaning throughout the session

4. Clinician makes active and repeated efforts to understand the client's point of view. Shows evidence of accurate understanding of the client's worldview, although mostly limited to explicit content.

Examples:

- Conveys interest in the client's perspective or situation
- Offers accurate reflections of what the *client has said already*
- Effectively communicates understanding of the client's viewpoint
- Expresses that the client's concerns or experiences are normal or similar to others'

5. Clinician shows evidence of deep understanding of client's point of view, not just for what has been explicitly stated but what the client means and has not said.

Examples:

- Effectively communicates an understanding of the client *beyond* what the client says in session
- Shows great interest in client's perspective or situation
- Attempts to "put self in client's shoes"
- Often encourages client to elaborate, beyond what is necessary to merely follow the story
- Uses many accurate complex reflections

## **E. BEHAVIOR COUNTS**

Behavior counts are intended to capture specific behaviors without regard to how they fit into the overall impression of the clinician's use of MI. Unlike global ratings, behavior counts will generally be determined as a result of categorization and decision rules, rather than attempting to grasp an overall impression. Coders should avoid relying on inference to determine a behavior count whenever possible.

**E.1. Parsing Interviewer Speech.** The session segment can be broken down into volleys, which are defined as uninterrupted segments of clinician speech. A volley begins when the clinician begins speaking and is terminated by client speech (other than facilitative comments such as “yeah, right, good”). It is the equivalent of turn-taking in a conversation.

**E.1.a. Parsing Rules.** Clinician volleys are comprised of a single or multiple clinician utterances. An utterance is defined as a complete thought or a thought unit (Gottman, Markman, & Notarius, 1977; Weiss, Hops, & Patterson, 1973). Behavior codes are assigned to clinician utterances, although not all utterances will receive a behavior code (see F. Statements that Are Not Coded in the MITI).

Each utterance may receive only one behavior code and each volley earns each code only once. For example, “You are worried about your drinking” is an utterance that is assigned one code. Whereas, “You are worried about your drinking; has this been a problem before?” is parsed into two utterances, that each receive a separate code. Thus, in the course of a relatively long reply, if a clinician reflects, confronts, gives information, then asks a question, these could each qualify for a distinct behavior code. Similarly, if a clinician offers Emphasizing Autonomy and an Affirm in the same volley, both codes would be given. (\*\*Note that this parsing rule for MI-Adherent and MI Non-Adherent utterances is different than previous versions of the MITI).

Reflections are handled differently. There is only one reflection code given per volley, regardless of the combination of simple and complex reflections in that volley. If any of the reflections are complex, then the Complex Reflection (CR) code is used. Otherwise, the reflection code is Simple Reflection (SR). For instance, if a clinician offers a simple reflection, asks a closed question, and then offers a complex reflection, the volley would receive two codes: complex reflection and question.

Finally, for questions, only one per volley is coded with the MITI 4.0. If multiple questions are offered within the same volley, the clinician will only receive a single Question behavior code.

The maximum possible number of codes per volley is 8. Only one of each of the following codes may be assigned per volley:

Giving Information (GI)  
Persuade (Persuade or Persuade with)  
Question (Q)  
Reflection Simple (SR) or Complex (CR)  
Affirm (AF)  
Seeking Collaboration (Seek)  
Emphasizing Autonomy (Emphasize)  
Confront (Confront)

**DECISION RULE:** If the coder is not sure whether to parse or not, the default should be to decide in favor of *fewer parses*.

## **E.2. Parsing Examples:**

E.2.a. Consider the following interviewer statement:

Well, let me ask you this: since you've been forced to come here and since you're feeling like everyone's kind of pecking on you like a crow—there's a bunch of crows flying around pecking on you about this thing about your drinking—what would you like to do with the time you spend here? What would be helpful for you?

This statement is parsed in the following way:

Utterance One: Well, let me ask you this: since you've been forced to come here and since you're feeling like everyone's kind of pecking on you like a crow—there's a bunch of crows flying around pecking on you about this thing with your drinking— (Complex Reflection)

Utterance Two: What would you like to do with the time you spend here? What would be helpful for you? (Seek)

E.2.b. What about this interviewer statement?

What you say is absolutely true, that it is up to you. No one makes that choice for you. Even if your wife wanted to decide for you, or your employer wanted to decide for you, or I wanted to decide for you; nobody can. It really is completely

your own choice—how you live your life, what you do about drugs, where you’re headed—so that is yours. And what I hear you struggling with is, “what do I want? Is it time for me to change things? Is this drug test a wake-up call?”

We’ve parsed it like this:

Utterance One: What you say is absolutely true, that it is up to you. No one makes that choice for you. Even if your wife wanted to decide for you, or your employer wanted to decide for you, or I wanted to decide for you; nobody can. It really is completely your own choice—how you live your life, what you do about drugs, where you’re headed—so that is yours. (Emphasizing Autonomy)

Utterance Two: And what I hear you struggling with is, “what do I want? Is it time for me to change things? Is this drug test a wake-up call?” (Complex Reflection)

E.2.c. What about this interviewer statement?

To answer your question, it is recommended that people eat at least 5 servings of fruit and vegetables each day. Of course, you are the only one who can determine what works for you in this regard. How many more a day would that be? I mean, can you do it?

We’ve parsed it like this:

Utterance One: To answer your question, it is recommended that people eat at least 5 servings of fruit and vegetables each day. (Giving Information)

Utterance Two: Of course, you are the only one who can determine what works for you in this regard. (Emphasizing Autonomy)

Utterance Three: How many more a day would that be? I mean, can you do it? (Question)

E.2.d. What about this interviewer statement?

You sound exhausted. I know that I was when I had to deal with that problem. You want to find resolution and you are working really hard for it!

We’ve parsed it like this:



Utterance One: You sound exhausted. (Reflection, could be simple or complex)

Utterance Two: I know that I was when I had to deal with that problem. (Self-disclosure, not coded)

Utterance Three: You want to find resolution and you are working really hard for it! (Affirm)

**E.3. When to Parse.** Client statements such as “yeah” or “right” that do not interrupt the interviewer sequence are considered facilitative statements, and should not interrupt the interviewer volley when coding. However, the volley might be parsed if the client’s facilitative statement serves as an answer to the clinician’s direct question or reflection. Remember, the default is to choose fewer parses.

For example, if the clinician says:

Let me see if I’ve got this straight. You’re not happy about being here today but you are willing to consider making a few changes. You realize your drinking has been causing you some problems and you think it might be time to make a change.

If the client responds “yeah” throughout the previous utterance as a way of conveying acknowledgment of the therapist, the utterance should not be parsed by the client’s interruption. Compare that to this clinician example:

You are really worried about your drinking and ready to make some changes. Do you think it’s time to talk about treatment?

Here, if the client responds with “Yeah” in agreement that it is time for treatment, the client statement would interrupt the utterance and a new volley would begin with the clinician’s next utterance.

When attempting to “keep up” with fast moving clinician/client interactions that contain multiple instances of facilitative speech, the coders is advised to remember the decision rule to parse fewer, rather than more, utterances.

## **E.4.Behavior Codes**

### **E.4.a. Giving Information**

This category is used when the interviewer gives information, educates, provides feedback, or expresses a professional opinion without persuading, advising, or warning. Typically, the tone of the information is neutral, and the language used to convey general information does not imply that it is specifically relevant to the client or that the client must act on it. No subcodes are assigned for Giving Information.

For example:

From my professional experience, I think that going to cardiac rehab is the best choice for most people in your situation.

The guidelines state that women should not drink more than seven drinks per week.

*E.4.a.1. Structuring statements are not coded as Giving Information.* These include statements that indicate what is going to happen during the session, instructions for an exercise during the session, set-up of another appointment, or discussion about the number and timing of sessions for a research protocol.

Examples of structuring statements:

I would like for you to take a look at this list of strengths and pick two or three that apply to you.

Now perhaps we'll take a look at your treatment plan and see what needs changing.

We only have two more sessions after this one so we should plan for that.

*E.4.a.2. Differentiating Giving Information from other Behavior counts.*

Giving information should not be confused with persuading, confronting, or persuading with permission.

From my professional experience, I think that going to cardiac rehab is the best choice for you. (Persuade)

From my professional experience, I think that going to cardiac rehab would be the best thing for you. What do you think about this as an option? (Persuade with permission; Seek)

You indicated during the assessment that you typically drink about 18 standard drinks per week. This far exceeds social drinking. (Confront)

Well, you are only eating two fruits per day according to this chart, even though you said you are eating five. It can be easy to deceive yourself. (Confront)

It worked for me, and it will work for you if you give it a try. We need to find the right AA meeting for you. You just didn't find a good one. (Persuade)

I would recommend that you always wear a bike helmet. It will really protect you in the event of a crash. (Persuade)

Today we're going to talk about some things that have worked for others. (Not coded – structuring statement)

The choice is yours, but in my opinion, staying in treatment would be a good thing for you. (Emphasize Autonomy; Persuade with Permission)

Continuing to drink at these levels can really harm your liver. (Persuade)

#### **E.4.b. Persuade**

The clinician makes overt attempts to change the client's opinions, attitudes, or behavior using tools such as logic, compelling arguments, self-disclosure, or facts (and the explicit linking of these tools with an overt message to change). Persuasion is also coded if the clinician gives biased information, advice, suggestions, tips, opinions, or solutions to problems *without* an explicit statement or strong contextual cue emphasizing the client's autonomy in receiving the recommendation.

Note that if the therapist is giving information in a neutral manner, without an explicit focus on influencing or convincing the client, the Giving Information code should be used.

Decision Rule: If the coder cannot decide between the Persuasion and the Giving Information code, the Giving Information code should be used. This decision rule is intended to set a relatively high bar for the Persuasion code.

You can't get five fruits and vegetables in your diet every day unless you put some fruit in your breakfast. (Persuade)

I used to be overweight but I decided to take my life into my own hands. You would be better off if you did the same thing. (Persuade)

You just don't know how good your life can be if you quit drinking altogether. (Persuade)

Well, your own father was a heavy drinker so it's very likely you are too. (Persuade)

Well, we know that sons of alcoholics carry an increased risk of problem drinking. (Giving Information)

I have some information about your risk of problem drinking and I wonder if I can share it with you. (Seek)

All of these things added together tell me that you will have a lot of trouble managing your blood sugar levels without some medication to help. I wouldn't tell you this unless I really thought it was the best thing for you. My job is to help you feel better, and I take that very seriously. (Persuade)

If you use a condom every time you have sex, then you never have to worry about whether you might have contracted a sexually transmitted infection. Wouldn't that be great? (Persuade)

We used to think that having kids in daycare was not good for them, but now the evidence indicates that it actually helps them have better social skills than kids who never attend. (Giving Information)

With everything going on in your life right now, how could it hurt to have your kids in daycare a couple of days a week? (Persuade)

#### **E.4.c. Persuade with Permission**

Persuade with Permission is assigned when the interviewer includes an emphasis on collaboration or autonomy support while persuading. The condition of permission may be present when

1. The client asks directly for the clinician's opinion on what to do or how to proceed.

2. The clinician asks the client directly for permission to provide advice, make suggestions, give opinion, offer feedback, express concerns, making recommendations, or discuss a particular topic.
3. The clinician uses autonomy supportive language to preface or qualify the advice such that the client may choose to discount, ignore, or personally evaluate that advice.

The clinician could seek a general sense of permission (How about we start today talking about your probation requirements?) or permission specific to a topic, condition, or action item (If it is alright with you, I'll share some strategies that have been used by others to keep their blood sugar in check.).

Permission may be obtained before, during or after persuasion is used, but must occur close to persuasion in time. If Persuade with Permission is accompanied by an explicit Seeking Collaboration or Emphasizing Autonomy, both the Persuade with Permission and the Seeking Collaboration or/Emphasizing Autonomy code should be assigned.

If a clinician has asked for more general permission, it does not need to be repeated for every statement or suggestion. There is a "condition of permission" that may last for several minutes. If the clinician changes the topic, becomes more directive, starts adding significant content (becomes the expert), or starts prescribing a plan without again asking permission, it is possible that the clinician would then receive a Persuade code.

Note that if the interviewer is providing information or advice in a neutral manner, the Giving Information code should be used instead. If the coder is uncertain, the GI code should be preferred.

Well, your father was a problem drinker so you definitely have an increased risk according to the numbers. But everyone is unique. What are your own thoughts about that? (Persuade with Permission; Seek)

For some of my clients, daycare can turn out to be a real lifesaver especially when life gets as demanding as yours is right now. But I know you've mentioned your concerns about that, so maybe it is not for you no matter what. (Persuade with Permission; Seek)

I have some ideas about getting your kids to help more. I got my own child to clean his room by using a star chart. He got a star for every day he cleaned his room and after he earned seven stars, he got to choose the movie for Saturday night. (Persuade)

### *Moving to Insulin*

Your A1C level has been over 12 the last 3 times we've checked it. In general, this puts people at risk for complications (Giving Information)

Looking at your A1C level, it is apparent that you've been having some trouble controlling your blood sugar levels, despite your best efforts. My best advice at this point is for you is to switch to injectable insulin and give up the oral medication. But I don't know if that is something you are willing to consider. I'd welcome your thoughts. (Persuade with Permission; Seek)

*Clinician:* I've reviewed your lab results and I wonder if I might share some thoughts about how you can improve your control of your blood sugar levels. (Seek)

*Client:* Sure, I'm curious what you think.

*Clinician:* Looking at your A1C level, it is apparent that you've been having some trouble controlling your blood sugar levels, despite your best efforts. My best advice at this point is for you is to switch to injectable insulin and give up the oral medication. But I don't know if that is something you are willing to consider. I'd welcome your thoughts. (Persuade with Permission; Seek)

### *Parenting Self Disclosure*

*Clinician:* Well, I have a story about my own child that might fit in here. I wonder if you'd be interested in hearing about my experiences. (Seek)

*Client:* Anything that would help.

*Clinician:* I got my own child to clean his room by using a star chart. He got a star for every day he cleaned his room and after he earned seven stars, he got to choose the movie for Saturday night. (Persuade with Permission)

### *Smoking Cessation*

*Clinician:* I wonder if it would be ok if I provide some information with you about ways to quit smoking? (Seek)

*Client:* Yes.

*Clinician:* I've had good luck with clients using the nicotine gum. (Persuade with Permission)

#### *E.4.c.1 Decision Rule for Persuade and Persuade with Permission*

Decision Rule: When both Persuade AND Persuade with Permission occur in the same utterance, the coder should only assign the Persuade with Permission code. This may result in uncoded Persuasion statements in the exchanges. To the extent that the coder judges that these uncoded persuasion statements impinge on the collaboration between the pair, this should be captured on the Partnership global rating.

#### **E.4.d. Questions**

All questions from clinicians (open, closed, evocative, fact-finding, etc.) receive the Question code but only one question per volley is coded. Thus, if a clinician asked four separate questions in a single volley, only one question would be tallied. Closed and open questions are not differentiated in the MITI 4.0. Instead, coders attend to the nature of the clinician's questions with the global ratings in mind. For example, many fact-finding questions within an interview *might* result in a lower rating on the Partnership global and reduce opportunities to Sidestep Sustain Talk.

#### **E.4.e. Reflections**

This category is meant to capture reflective listening statements made by the clinician *in response to* client statements. Reflections may introduce new meaning or material, but they essentially capture and return to clients something about what they have just said. Reflections may be either Simple or Complex.

##### *E.4.e.1. Simple Reflection*

Simple reflections typically convey understanding or facilitate client-clinician exchanges. These reflections add little or no meaning (or emphasis) to what clients have said. Simple reflections may mark very important or intense client emotions, but do not go far beyond the client's original statement. Clinician summaries of several client statements may be coded as simple reflections *if* the clinician does not use the summary to add an additional point or direction.

#### *E.4.e.2. Complex Reflection*

Complex reflections typically add substantial meaning or emphasis to what the client has said. These reflections serve the purpose of conveying a deeper or more complex picture of what the client has said. Sometimes the clinician may choose to emphasize a particular part of what the client has said to make a point or take the conversation in a different direction. Clinicians may add subtle or very obvious content to the client's words, or they may combine statements from the client to form summaries that are directional in nature.

#### *Speeding Tickets*

*Client:* This is her third speeding ticket in three months. Our insurance is going to go through the roof. I could just kill her. Can't she see we need that money for other things?

*Interviewer:* You're furious about this. (Simple Reflection)

or

*Interviewer:* This is the last straw for you. (Complex Reflection)

#### *Controlling Blood Sugar*

*Interviewer:* What have you already been told about managing your blood sugar levels? (Question)

*Client:* Are you kidding? I've had the classes, I've had the videos, I've had the home nurse visits. I have all kinds of advice about how to get better at this, but I just don't do it. I don't know why. Maybe I just have a death wish or something, you know?

*Interviewer:* You are pretty discouraged about this. (Simple Reflection)

or

*Interviewer:* You don't know why you're sabotaging yourself. (Complex Reflection)

#### *Mother's Independence*

*Client:* My mother is driving me crazy. She says she wants to remain independent, but she calls me four times a day with trivial questions. Then she gets mad when I give her advice.



*Interviewer:* Things are very stressful with your mother. (Simple Reflection)  
or  
*Interviewer:* You're having a hard time figuring out what your mother really wants. (Complex Reflection)  
or  
*Interviewer:* Are you having a hard time figuring out what your mother really wants? (Question)  
or  
*Interviewer:* What do you think your mother really wants? (Question)

#### *Smoking*

*Client:* I'm so tired of being told what to do. No one understands how difficult this is for me.  
  
*Interviewer:* Is this overwhelming you? (Question)  
or  
*Interviewer:* You are angry and frustrated. (Complex Reflection)  
or  
*Interviewer:* It's hard for people around you to get it. (Complex Reflection)

**DECISION RULE:** When a coder cannot distinguish between a simple and complex reflection (including for summaries), the default is to code a Simple Reflection.

#### *E.4.e.3. Series of Reflections*

When a clinician offers a series of simple and complex reflections *in the same volley*, only one Complex Reflection should be coded. Reflections often occur in sequence, and over-parsing can lead to difficulties in obtaining reliability or take away from the intent of the volley. Therefore, if a clinician offers a Simple Reflection, followed by an Emphasizing Autonomy statement, and then a Complex Reflection, only the codes of Complex Reflection and Emphasize would be given.

#### *Diet Failure*

*Client:* I keep failing in this diet. I do okay for a while, but then I find myself eating an entire pan of brownies, and ruining all my progress. Do you know how

many calories there are in a pan of brownies? Never mind the ice cream I eat with them. I never realized it would be so hard.

*Clinician:* It's two steps forward and then one step back. That kind of progress just doesn't seem enough. And what's hard is that something that is so normal for you, like a pan of brownies, is so terrible for your weight. If you knew this would be so hard, you might not have even tried to lose weight. (Complex Reflection)

*Client:* No, I have to do this. Even if I have to accept that I will never eat another brownie the rest of my damn life, I still have to stop killing myself with my weight.

*Clinician:* You want to lose weight so much that you would even give up brownies if you really had to. (Complex Reflection, added value for Cultivating Change Talk)

or

*Clinician:* Actually, you don't have to give up any food forever. Research shows that when you try to restrict yourself from foods you love, you will just eat more of them. The best goal is to eat them in moderation. (Persuade)

#### *E.4.e.4. Reflection and Question in Sequence*

Sometimes the interviewer begins with a reflection, but adds a question to “check” the reliability of the reflection. Both elements should be coded.

*Client:* I just can't keep using like this.

*Clinician:* You're certain you don't ever want to use heroin again. Is that right? (Complex Reflection, Question)

*Client:* My boss said I'm on probation now. No overtime, no bonuses. Nothing.

*Clinician:* Your boss said you can't work overtime anymore because of this incident. What do you make of that? (Simple Reflection, Question)

#### *E.4.e.5 Structuring Statements posing as reflections*

Sometimes the interviewer will ask a question, but will precede the question with information designed to cue the listener about the context for it. Essentially this functions as a way of saying, “Remember that other thing you said? Well, now I want to ask you this about it”. These types of structuring statements that occur prior to questions should *not* be coded as separate reflections. Instead they should be considered structuring statements to provide context for a question and therefore not coded. The intent of this rule is to avoid giving credit for reflections when the interviewer is merely cueing the client about the topic.

If the interviewer makes a clear distinction or stop between the “set up” statement and the question, a separate reflection may be coded. For this to be the case, the client should have an opportunity to respond in some way before the question occurs.

*Interviewer:* You were describing that you haven’t returned to that store where you stole the candy. Do you feel you are avoiding it? (Question)

or

*Interviewer:* You haven’t returned to the store where you stole the candy. (Simple Reflection)

*Client:* Right.

*Interviewer:* Do you feel you are avoiding it? (Question)

When the coder determines that the purpose of the reflection is to provide a foundation or a cue for a question, it should not be coded.

#### **E.4.f. MI-Adherent (MIA) Behaviors**

It is important to note that often examples of good MI practice will not earn an MIA code. One common mistake for novice coders (and expert practitioners of MI) is to spot example of good MI practice that they try to “fit” into one of the MIA codes. Take care to assign only the MIA codes that are available here, and only when the example “rings the bell” as a clear example of the code. When in doubt, or when you are working too hard to make the example fit, select another code instead. Remember that adjusting a global rating can help compensate for elements of excellent MI practice that are not easily captured with a behavior count.

**\*\*Unlike previous versions of the MITI, each subtype of MI Adherent (MIA) behavior is now coded and tallied separately.**

*E.4.f.1 What happens when a statement might fit more than one MIA Category?*

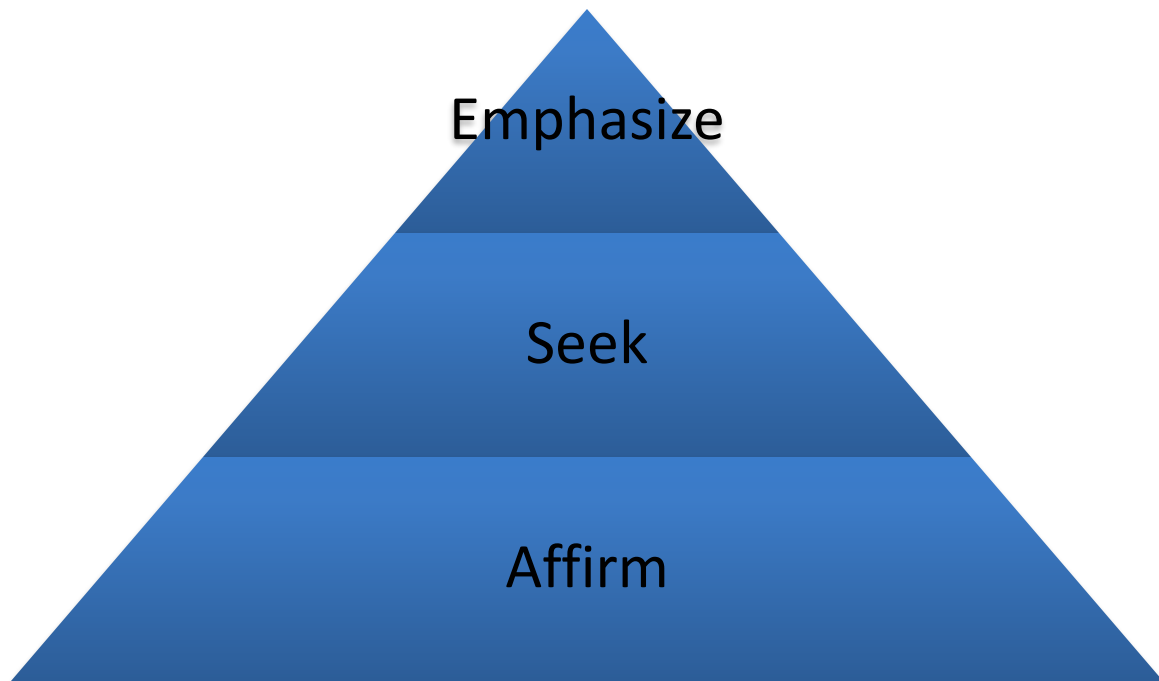
*“Trump” (origin 1580’s)*

*verb: to surpass or beat*

*noun: playing card of a suit that ranks above the others*

Most of the time, coders will be able to assign a MIA code with certainty. Sometimes, though, coders will encounter single utterances that could fit into more than one MIA category. As with all other MITI codes, uncertainty about MIA is resolved by using a decision rules. These are sometimes called trumping rules, because they tell the rater which codes should prevail when the decision is unclear.

The following hierarchy should be used to determine which code should be assigned for MIA (see Figure 1). If the coder is unsure which code is more appropriate, the lower code should be used (i.e., it should be the default). For example, if the coder is uncertain whether to assign Emphasize Autonomy or Seek, the Seek code should be used. Lower codes on the pyramid are given *when the coder is uncertain*. To assign the highest code on the pyramid, the coder should have a reasonable degree of confidence that the code is a true example of that category. When there is less certainty, the coder defaults to the lower codes. The intent of this trumping pyramid is to “protect” codes having high importance in motivational interviewing from being assigned too easily. Affirmations, for example, are relatively “inexpensive” for the interviewer, whereas emphasizing autonomy is both more challenging to achieve and has greater theoretical interest. Therefore, the bar is intentionally set higher for the Emphasize Autonomy code.



**Figure 1: Decision rules for MIA codes**

*E.4.f.1.a. What if the coder is not sure whether the code should be a MIA or some other code (such as a Question or a Reflection)?*

When in doubt, the coder should *not* code MIA. Thus, if a statement could be coded as MIA or some other code, MIA should be assigned only if falls clearly within that category. When uncertain, the coder selects the other code.

*E.4.f.2. Affirm (AF)*

An affirmation (AF) is a clinician utterance that accentuates something positive about the client. To be considered an Affirm, the utterance must be about client's strengths, efforts, intentions, or worth. The utterance must be given in a genuine manner and reflect something genuine about the client. It does not have to be focused on the change goal and could reflect a "prizing" of the client for a specific trait, behavior, accomplishment, skill, or strength. Affirms are often complex reflections, and when this occurs, the Affirm code should be preferred.

Affirm should not be coded automatically for the clinician's agreeing with, approval of, cheerleading for, or non-specific praising of the client. They must be explicitly linked to client behaviors or specific characteristics. The utterance must seem genuine and not merely facilitative.

**\*\*Note that this definition of Affirm is more stringent than that both what is used in *Motivational Interviewing* (Miller & Rollnick, 2013) and in previous versions of the MITI. Specifically, statements of support (“It’s always hard when you are getting started”) are no longer coded in the MITI.**

If the coder is not certain whether the statement is specific or strong enough to merit the Affirm code, *it should not be assigned.*9.9

You came up with a lot of great ideas on how to reduce your drinking. Great job brainstorming today. (Affirm)

It’s important to you to be a good parent, just like your folks were for you. (Affirm)

I am really proud of you. (Not coded; not specific).

You have been able to avoid sweets throughout the holiday and you’re proud of your accomplishment. It has paid off! (Affirm; trumps Reflection)

You are the kind of person who takes her responsibilities seriously, wanting to do the right thing. (Affirm)

With the parking problems and the rain coming down, it hasn’t been easy to get here. I appreciate that you continue to come. (Affirm)

I know it’s really hard to stop smoking. (Support; not coded)

You did great! (Not coded)

Way to go! (Not coded)

You’ve been working so hard at being a good parent. I’m so impressed with your willingness to stay in there even when the going gets tough! (Affirm)

Given what you have told me about your previous success with losing weight, I am confident that you will be successful again when you are ready. (Affirm)

You’re feeling pretty discouraged about the fast foods. You had hoped to not hit the drive thru at all this past two weeks. It strikes me though that, even if you

went for fast food twice during that time, that is considerably less than when you were going every day. That seems like a big change! (Affirm)

#### *E.4.f.2.a. Three strikes rule for Affirmations*

Clinicians can overuse affirmations by repeating them many times during the conversation. In general, the first two or three times, the statement may be credible and coded as an Affirm if the coder is confident that the utterance still clearly falls into the Affirm category. After that, they are typically not coded.

#### *E.4.f.3 Seeking Collaboration*

This code is assigned when a clinician explicitly attempts to share power or acknowledge the expertise of the client. It can occur when the clinician genuinely seeks consensus with the client regarding tasks, goals or directions of the session. Seeking collaboration may be assigned when the clinician asks what the client thinks about information provided. When permission to give information or advice is sought, Seeking Collaboration is typically assigned.

When a clinician asks about the client's knowledge or understanding of a particular topic, this is coded as a Question. It is not considered to be Seeking Collaboration.

I have some information about how to reduce your risk of colon cancer and I wonder if I might discuss it with you. (Seeking Collaboration)

What have you already been told about drinking during pregnancy? (Question)

Would it be alright if we spend some discussing the standards for consuming alcohol during pregnancy (Seeking Collaboration)?

This may not be the right thing for you, but some of my clients have had good luck setting the alarm on their wristwatch to help them remember to check their blood sugars two hours after lunch. (Seeking Collaboration, consider Persuade with Permission)

How can I help you with this? (Seeking Collaboration)

Would it be all right if we spent some time talking about smoking? I know you didn't come here to talk about that. (Seeking Collaboration)

I have your assessment results. Are you interested in going over those? (Seeking Collaboration)

E.4.f.3.a Note: Elicit–Provide–Elicit (E–P–E) exchanges may *or may not* be an example of seeking collaboration. Each item is typically coded separately.

*Elicit-Provide-Elicit without Seeking Collaboration*

Clinician: What do you already know about drinking during pregnancy (Question)?

Client: I know it's better if I don't drink.

Clinician: Yes. It's recommended that women abstain from alcohol during pregnancy. (GI)

*Elicit-Provide-Elicit with Seek Collaboration*

Clinician: What do you already know about drinking during pregnancy (Question)?

Client: I know it's better if I don't drink.

Clinician: What do you make of this information? How does it fit in with your approach to drinking? (Seeking Collaboration)

In contrast to:

*Clinician:* What do you already know about possible ways of quitting smoking? (Question)

*Client:* I know that the patch is supposed to be the most effective for quitting. How long can I be on the patch? Is it only supposed to be used for a week or two?

*Clinician:* The patch is one way to quit smoking. It is an effective method and is typically used for about four to six months (GI).

*E.4.f.4. Emphasizing Autonomy (Emphasize)*



These are utterances that clearly focus the responsibility with the client for decisions about and actions pertaining to change. They highlight clients' sense of control, freedom of choice, personal autonomy, or ability or obligation to decide about their attitudes and actions. These are *not* statements that specifically emphasize the client's sense of self-efficacy, confidence, or ability to perform a specific action.

Yes, you're right. No one can force you stop drinking. (Emphasizing Autonomy)

You're the one who knows yourself best here. What do you think ought to be on this treatment plan? (Emphasizing Autonomy)

The number of fruits and vegetables you choose to eat is really up to you. (Emphasizing Autonomy)

This is really your life and your path. You are the only one who can decide which direction you will go. Where do you think you would like to go from here with your exercise? (Emphasizing Autonomy)

You are in a tough spot. Being in jail leaves you feeling like you have no control over your life. And you are being asked to consider engaging in a treatment program that might give you some control back if you decide to do that. You are not sure what to choose at this point. (Emphasizing Autonomy)

This is both an opportunity and a challenge as you see it. You are weighing the options and figuring out what will work best for you. (Emphasizing Autonomy)

### *Quit drinking*

*Client:* I'm pretty sure I can quit drinking for good.

*Clinician:* You feel confident you can quit drinking because you have done it before. (Reflection; Added value for Cultivating Change Talk)

*Clinician:* There's a choice in front of you and you feel pretty sure which way you want to go (Emphasizing Autonomy)

*Clinician:* You feel pretty sure about which way you want to go (Reflection; Added value for Cultivating Change Talk)

*Clinician:* You're ready to stop (Reflection; Added value for Cultivating Change Talk)

### *Checking Blood Sugar Levels*

*Client:* I'm not ready to check my blood sugar every day, but I could do it once a week or so.

*Clinician:* In the end, it's really up to you how often you check your blood sugar. (Emphasizing Autonomy)

*Clinician:* One change you're considering is checking weekly. (Simple Reflection; Added value for Cultivating Change Talk)

*Clinician:* It's really hard to get that test in every day (Complex Reflection; Decreased value for Softening Sustain Talk)

### *HIV test*

*Client:* Last week I talked to the Advice Nurse about a home test. She said I could buy one at the drugstore and get the results back right away.

*Clinician:* You have already taken some steps to find the answer you need. (Reflection; Added value for Cultivating Change Talk)

*Clinician:* Now you have to make the decision about what is the best choice for you. (Emphasizing Autonomy)

*Clinician:* You feel two ways about finding out (Complex Reflection)

*Clinician:* I have some information about the home testing kits. I wonder if I could share it with you. (Seeking Collaboration)

*Clinician:* Yahoo! You made it to your goal! (Affirm)

*Clinician:* You've got what it takes. (Affirm)

## **E.4.g. MI Non-Adherent (MINA) Behaviors**

There are only two MINA codes: Persuade and Confront.

*E.4.g 1. Persuade (see Section E.4.b.)*

*E.4.g.2. Confront.*

This code is used when the clinician confronts the client by directly and unambiguously disagreeing, arguing, correcting, shaming, blaming, criticizing, labeling, warning, moralizing, ridiculing, or questioning the client's honesty. Such interactions will have the quality of uneven power sharing, accompanied by disapproval or negativity. Included here are instances where the interviewer uses a question or even a reflection, but the voice tone clearly indicates a confrontation.

Restating negative information already known or disclosed by the client can be either a Confront or a Reflection. Most Confronts can be correctly categorized by careful attention to voice tone and context.

Decision Rule: In the relatively unusual circumstance where the coder is not certain whether to code an utterance as a Confrontation or Reflection, *no code should be assigned*.

You were taking Antabuse but you drank anyway? (Confront)

You think that is any way to treat people you love? (Confront)

Yes, you are an alcoholic. You might not think so, but you are. (Confront)

Wait a minute. It says right here that your A1C is 12. I'm sorry, but there is no way you could have been controlling your carbohydrates like you said if it's that high. (Confront)

Think of your kids, for crying out loud. (Confront)

You have no concerns whatsoever about your drinking? (Confront; Question code not assigned since Confront trumps Question)

Most people who drink as much as you do cannot ever drink normally again. (Confront)

I have a concern about your plan to drink moderately and I wonder if I can share it with you. (Seeking Collaboration)

Disciplining your child with punishment is a slippery slope. It seems alright in the beginning but then one thing leads to another. (Confront)

Remember you said that your cholesterol level was a threat to your life. If you can't get your diet under control, you are risking a stroke or a heart attack. (Confront)

Well, kids who are not supervised closely by their parents are at higher risk for substance abuse. I wonder what you think about your own parenting skills in that regard. (Probably Confront—listen for tone)

If you choose to continue to drink, there's nothing we can do to help you. (Probably Confront—listen for tone).

When clinicians use confrontation to emphasize a client strength, virtue or positive achievement, the Affirm code should be considered. A Confront is not mandatory when the clinician is clearly attempting to affirm or support the client.

#### *Terrible Mother*

*Client:* I'm a terrible mother.

*Clinician:* No, you are *not*. You are having some troubles, but you are still a great mother. (Affirm)

#### *Cholesterol Improvement*

*Client:* I improved this month. I ate at least three servings of fruits or vegetables every single day.

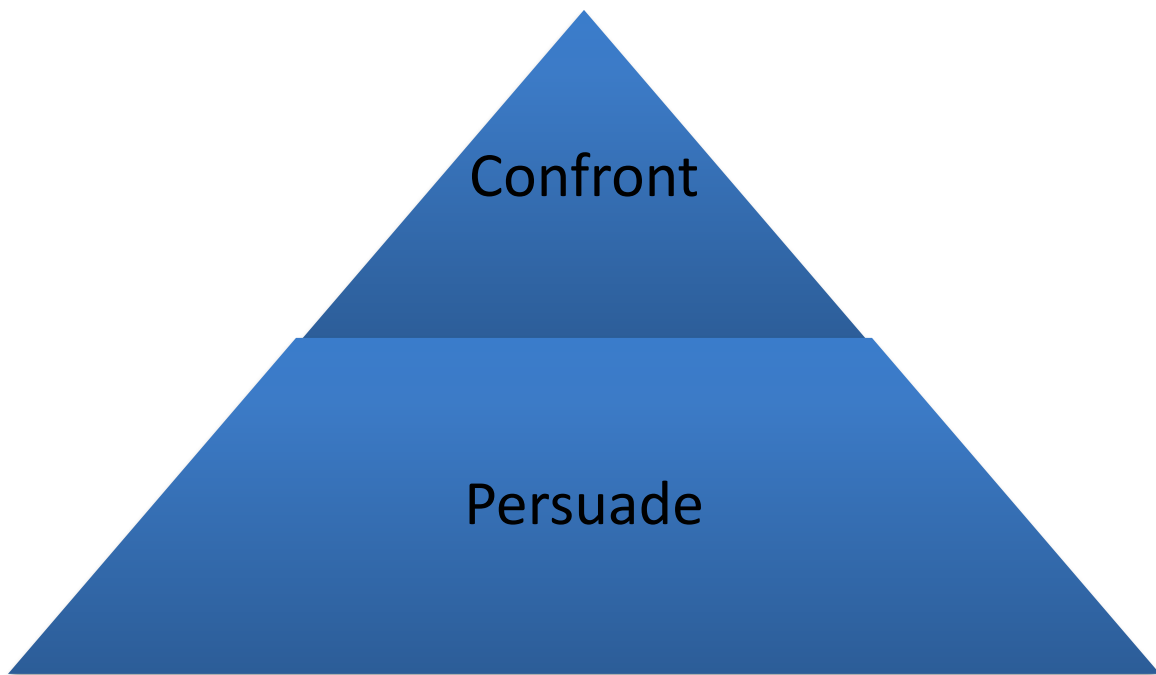
*Clinician:* Yes, but your cholesterol level is still way too high. (Confront)

or

*Clinician:* You've made some real progress in your eating habits. What do you make of that in terms of your longer-term health goals? (Affirm; Seeking Collaboration)

#### *E.4.g.3. Decision rules for MINA*

Persuasion and confrontation sometimes overlap and can fit in more than one category. When this happens, the following hierarchy should be used (see Figure 2):



**Figure 2: Decision rules for MINA codes**

#### **F. STATEMENTS THAT ARE NOT CODED IN THE MITI**

The MITI is not an exhaustive coding system because some utterances may not receive a behavior code.

Examples of utterances that are not coded in the MITI.

Structure statements:	“Now we’ll talk about the forms from last week.”
Greetings:	“Hi Joe. Thanks for coming in today.”
Facilitative statements:	“Okay, all right. Good.”
Previous session content:	“Last week you mentioned you were really tired.”
Incomplete thoughts:	“You mentioned...” (client interrupts)
Off-topic material:	“It’s a bit cold in here.”

## **G. CHOOSING THE LENGTH AND TYPE OF THE CODED SEGMENT**

The development of the MITI was done using 20-minute segments of psychotherapy tapes. It may be possible to use the MITI for longer audio segments (e.g., the entire session). We only caution that our attempt to increase the length of the coding segment was associated with (1) problems with sustained coder attention, (2) difficulty forming global judgments with increased data, and (3) logistical difficulties in obtaining uninterrupted work time in a busy setting.

Similarly, most of our initial data have been gathered using audio recordings rather than video. The MITI can be used to code video, but should not be altered to gather visual information.

## **H. SUMMARY SCORES**

Because critical indices of MI functioning are imperfectly captured by frequency counts, we have found that many applications of coding are better served with summary scores computed from code frequencies, rather than the individual scores themselves. For example, the ratio of reflections to questions provides a concise measure of an important MI process. Below is a partial list of summary scores that serve as outcome measures for determining competence in MI, as well as formulas for calculating them.

- Technical Global (Technical)  
= (Cultivating Change Talk + Softening Sustain Talk) / 2
- Relational Global (Relational)  
= (Partnership + Empathy) / 2
- (% CR)  
= CR / (SR + CR)
- Reflection-to-Question Ratio (R:Q)  
= Total reflections/ (Total Questions)
- Total MI-Adherent  
= Seeking Collaboration + Affirm + Emphasizing Autonomy

- Total MI Non-Adherent  
= Confront + Persuade

Note that these formulas will yield summary scores that are not comparable to previous versions of the MITI.

## I. CLINICIAN BASIC COMPETENCE AND PROFICIENCY THRESHOLDS

Below are suggested MITI basic competence and proficiency thresholds for clinicians. Please note that these are based upon *expert opinion*, and currently lack normative or other validity data to support them. Until those data become available, these thresholds should be used in conjunction with other data to arrive at an assessment of clinician basic competence and proficiency in using MI.

	<b>Fair</b>	<b>Good</b>
Relational	3.5	4
Technical	3	4
% CR	40%	50%
R:Q	1:1	2:1
Total MIA	-	-
Total MINA	-	-

## **List of MITI Codes**

### **GLOBAL RATINGS**

Cultivating Change Talk	(Cultivate)
Softening Sustain Talk	(Sidestep)
Partnership	(Partner)
Empathy	(Empathy)

### **BEHAVIOR COUNTS**

Giving Information	(GI)
Persuade	(Persuasion)
Persuade with Permission	(Persuasion with)
Question	(Q)
Simple Reflection	(SR)
Complex Reflection	(CR)
Affirm	(AF)
Seeking Collaboration	(Seek)
Emphasizing Autonomy	(Emphasize)
Confront	(Confront)



Recording #: \_\_\_\_\_ Coder: \_\_\_\_\_ Date: \_\_\_\_\_  
 \_\_\_\_/\_\_\_\_/\_\_\_\_

### Global Ratings

Technical Components					
Cultivating Change Talk	1	2	3	4	5
Softening Sustain Talk	1	2	3	4	5
Relational Components					
Partnership	1	2	3	4	5
Empathy	1	2	3	4	5

Target Change: \_\_\_\_\_

### Behavior Counts

	Total
Giving Information (GI)	
Persuade (Persuade)	
Persuade with Permission (Persuade with)	
Question (Q)	
Simple Reflection (SR)	
Complex Reflection (CR)	
Affirm (AF)	
Seeking Collaboration (Seek)	
Emphasizing Autonomy (Emphasize)	
Confront (Confront)	

Start time and  
sentence: \_\_\_\_\_

End time and  
sentence: \_\_\_\_\_

## **APPENDIX C**

### **MISC 2.1 GLOBAL**

#### **Global Client Rating (MISC 2.1)**

The rating should reflect the client's high point during the session. This is a period (more than momentary) that reflects the client's highest level of self-exploration during the session. Because client's behavior often changes markedly over the course of a session, this is not meant to be an average across the entire session.

#### **Specific Guidelines:**

- The rating is made on a 7-point Likert scale. Assign the rating that best describes the client's high point of self-exploration during the session.
- The rating should be based primarily on the client's behavior during the observed session.
- Circle one and only one number, and do not leave this item blank. Do not make a rating that falls between the numbers.
- It is helpful to note examples of self-exploration and personally relevant material on the rating sheet as you listen to the session.

#### **Rating Description**

1. No personally relevant material is revealed or discussed by the client during the session.
2. The client avoids bringing up personally relevant material but may respond minimally if the counselor brings it up.
3. The client may respond to and elaborate on personally relevant material that is brought up by the counselor, but does not add significant material or volunteers information in a mechanical manner or without demonstration of emotional feeling.
4. The client elaborates on or volunteers personally relevant material with either spontaneity (not directly solicited by the counselor) or feeling, but not both.
5. The client elaborates on personally relevant material with both spontaneity (not directly solicited by the counselor) and feeling.
6. The client explores and discusses personally relevant material, discovering new feelings, perspectives, or personal meanings.
7. The client engages in active intrapersonal exploration, openly exploring values, feelings, relationships, fears, turmoil, life-choices, and perceptions of others. Clients may experience a shift in perception.

#### **Defining "Personally Relevant Material" in Coding Self-Exploration**

Personally relevant material may include expression or exploration of the following:

- Personal problems
- Self-descriptions that reveal the self to the counselor, expressions of the internal world
- Personally private material which when revealed tends to make the client more vulnerable or could be personally damaging
- Personal values, life choices
- Expression of feelings
- Personal roles, perception of one's relationship to others
- Perception of self worth

## **APPENDIX D**

### **CLEAR CODING MANUAL**

Manual for the Client Language EAsy Rating (CLEAR) Coding System:  
Formerly “Motivational Interviewing Skill Code (MISC) 1.1”  
*(As used in the Talking about Drinking study, 2008)*

*Lisa Hagen Glynn & Theresa B. Moyers*  
Center on Alcoholism, Substance Abuse, and Addictions  
University of New Mexico

“For me, words are a form of action, capable of influencing change.”  
- Ingrid Bengis

*Purpose, History, and What to Code*

*Purpose.* The CLEAR (previously named MISC 1.1) coding system serves as both an addendum to the MISC 1.0 (Miller, 2000) and as a stand-alone coding system. The sole purpose of the CLEAR is to classify and quantify client language that is either change talk (CT) or counter-change talk (CCT). As such, CLEAR focuses upon the types of in-session client language that have been predictive of future change (or non-change). When all that is of interest is how much CT and CCT are present in a Motivational Interviewing (MI) therapy session, we believe that this system represents an appropriate and efficient way to characterize these types of client language.

*History.* The CLEAR system builds directly upon the work of Miller and colleagues (e.g., Miller, 2000; Miller, Moyers, Ernst, & Amrhein, 2008) and is an adaptation of the client-language portion of the MISC 1.0, which offers a simple coding scheme for in-session client language. Unlike the MISC 1.0, version 1.1 includes only two categories—Change Talk and Counter-Change Talk—and leaves the previously included Ask and Follow/Neutral categories uncoded. However, CLEAR also adds upon MISC 1.0 by providing updated names and definitions for CT and CCT categories and sub-categories (although sub-categories are not coded individually) that are more specific and consistent with recent Motivational Interviewing research. Later versions of the MISC 1.0 (i.e., MISC 2.1 and MISC 2.5) are more complex than the CLEAR and provide more extensive information about each session.

The benefits of CLEAR are its simplicity, relative ease of training and use, non-reliance on session transcripts, and ability to calculate the Percentage Change Talk variable. Percentage Change Talk was the primary outcome variable of the Talking about Drinking study has been used in other studies conducted by CASAA; it is defined as change talk frequency over the sum of change talk frequency plus counter-change talk frequency ( $\% CT = CT / [CT + CCT]$ ).

To determine which coding system might be most appropriate for your purposes, please refer to Table 1, which compares the CLEAR to other MI coding systems available free of charge from the CASAA Web site (<http://casaa.unm.edu/codinginst.html>).

Table 1.

Comparing and Contrasting Motivational Interviewing Coding Systems

Coding System	Client Behaviors	Therapist Behaviors	Sequential	Whole Session	Detailed CT/CCT	Globals	Significant Other	Transcript Needed
CLEAR	X			X				
MISC 1.0	X	X		X		X		
MISC 2.1	X	X		X	X	X		X
MISC 2.5	X	X	X	X	X	X		

MITI		X					X	
3.1								
MISO				X		X	X	X
SCOPE	X	X	X	X	X	X		X
GROM				X		X		
IT								

*What to code.* The following considerations will help to define the CLEAR coding system and distinguish it from other ways of coding MI therapeutic interactions.

- CLEAR is intended for use with audio (not video) recordings; if video recordings must be used, visual information should be disregarded, so we suggest obscuring the monitor.
- CLEAR is coded aurally (i.e., directly from session recordings), and typically without the use of transcripts.
- This system is neither mutually exclusive nor collectively exhaustive: Only client CT and CCT are coded, and neutral client language and all therapist language are ignored.
- Unlike many of its coding-system counterparts, the CLEAR is coded in just one pass.
- Only behavior counts are coded—not global ratings.
- CLEAR is not sequential, so behaviors are coded using only tallies.
- The entire session should be coded (i.e., not just a 20-minute sample as in the MITI).



- Several types of CT and CCT are recognized, and each is counted as a separate utterance. However, utterances are not classified by their specific sub-categories—just by their valence (i.e., CT or CCT).
- Like most MI coding systems, a target behavior must be specified for the coding system to be meaningful.
- Transcripts are not used to code the CLEAR, and therefore utterances are not pre-parsed in this system; however, using transcripts might be useful when first introducing the concept of parsing.
- Please note that in the Talking about Drinking study tallies were calculated by quartile (i.e., each fourth of the timed session) and then summed overall, but only because the quartiles related to specific study hypotheses; the typical CLEAR user will prefer to record tallies for the entire session using the CLEAR Coding Sheet (see Appendix).

“Discussion is an exchange of knowledge; argument an exchange of ignorance.”

*- Robert Quillen*

## **Coders, Training, and Reliability**

*Coders. Although we have not collected empirical data about the characteristics of an ideal Motivational Interviewing coder, CASAA has been successful in training coders from undergraduates to professionals. Training coders in any coding system requires a significant investment of time (and possibly of money), even when teaching a simple one such as CLEAR. For the Talking about Drinking study, coders were advanced undergraduate volunteers who made a year-long commitment to the project.*

*We recommend training at least three coders at a time so that you will still have two coders if one coder must leave the study early; this will allow you to calculate reliability analyses.*

**Training.** *Training novice coders to reliability in this coding system is expected to take roughly 5 instructional hours, 15 hours of individual coding practice per coder, and an hour of weekly group-coding practice throughout the project to minimize coder drift. Because CLEAR merely collapses the sub-categories of CT and CCT, training*

*coders already proficient in other MISC coding systems likely would take just a few hours. To teach the CLEAR, we suggest the following progression:*

- *Provide an overview of the system and its goals.*
- *Practice listening and parsing. (Reassure coders that the client-therapist interaction will seem to “slow down” as they become more comfortable with the system; in this way coding is much like learning a new language.)*
- *Introduce CT and CCT (and their sub-categories).*
- *Practice distinguishing CT and CCT from neutral client language.*
- *Code CT and CCT in a group setting.*
- *Have coders rate recordings independently. (Note: Do not use recordings from your current study for training or reliability checks!)*
- *Conduct statistical inter-rater reliability checks periodically.*
- *Meet as a group to give feedback, discuss independent codes, and resolve questions and disagreements.*

*Reliability.* It is important to calculate coder reliability after every few recordings. To do so, we suggest the use of intraclass correlations (ICCs), which can be calculated easily in SPSS. According to Cicchetti (1994), ICCS of .75–1.00 are excellent, .60–.74 are good, .40–.59 are fair, and below .40 are poor. When test reliabilities become consistently high, then administer an independent coding sample of approximately 5–10 tapes, which will serve as a “final exam”. Scores of approximately .60 or higher on both CT and CCT usually indicate that coders are ready to begin coding “real” study recordings. We suggest double-coding 20% of the study sample.

## Parsing

*Parsing refers to breaking up language into utterances—that is, meaningful units of speech. To parse client language using the CLEAR, first separate out client and therapist “volleys”—that is, speaking turns. Then divide each client volley into “utterances”—that is, complete ideas. Each complete client idea that is CT or CCT will receive a code (and therefore, a tally mark on the coding sheet). Typically, a new therapist utterance will end a client utterance.*

*Although parsing should be introduced prior to coding, how to parse skillfully will become more obvious after starting to learn how to code and to distinguish CT and CCT from neutral client language. Consider the parsing of the following dialogue. (Note: Brackets indicate parsed utterances. Superscripts following brackets indicate neutral client language (<sup>0</sup>), change talk (+), or counter-change talk (–).)*

*Example.*

Therapist:	What brings you in today?
Client:	[I got caught drinking in the dorms last weekend. My roommate said that I had, like, nine shots, so I guess I was pretty wasted that night. But I don’t really even remember getting in trouble.] <sup>0</sup>
Therapist:	You’re not even sure why you’re here, then.
Client:	[No—just because I got a little drunk doesn’t mean that I need to be in counseling.] <sup>–</sup>
Therapist:	The punishment seems a little disproportionate to the crime.
Client:	[Exactly!] <sup>–</sup> [Plus, none of my friends ended up here and most of them drink a lot more than I do.] <sup>–</sup>
Therapist:	You drink less than everyone else you know.
Client:	[I wouldn’t say less than <i>everyone</i> ] <sup>+</sup> , [but I’m not an alcoholic, either.] <sup>–</sup>
Therapist:	You haven’t really noticed any problems with your drinking so far.
Client:	[No—I never miss work because of drinking] <sup>–</sup> , [I make it to most of my classes,] <sup>–</sup> [and I don’t drive after I drink at parties.] <sup>–</sup> [On a

usual weekday night I have a couple of drinks and then go out with friends.]<sup>0</sup> [Does that sound like a “problem” to you?] <sup>0</sup> [I definitely don’t think so.]

<p>“Words are, of course, the most powerful drug used by mankind.” - Rudyard Kipling</p>
--

## Coding

**Target behavior.** *In order to code CLEAR, it is crucial that the topic of the conversation—that is, the “target behavior” that is to be changed—is known before beginning coding. In a substance-abuse-treatment setting, the target behavior change is usually obvious (e.g., decreasing alcohol use or abstaining from all drugs), but in other settings it might be less so (e.g., controlling blood sugars in primary care, increasing brushing and flossing at a dental office, or increasing physical activity in a weight-loss center). The target behavior change should be specified by your particular project or setting to avoid confusion; for example, the Talking about Drinking study specified the target behavior change as any movement away from problematic drinking or toward harm reduction, moderation, or abstinence, but client language about other drugs was ignored. In some cases, the target behavior change might be broader (e.g., any lifestyle changes that will prevent heart attack).*

**Neutral client language.** *Neutral, or non-change, client language, does not receive a code in CLEAR, it is important to be able to recognize it so that it can be distinguished from CT or CCT. Neutral client language includes:*

- Questions asked of the therapist

- “What do you think I should do?”
- Reporting of factual information (e.g., drinks per week)
  - “Sometimes on Fridays I’ll go out to the bar.”
- Story-telling unrelated to current change in the target behavior
  - “I was downtown with my girlfriend a while back and we ran into some old friends. We had a few beers and were going to catch a movie, but she was tired from work and just wanted to go home.”
- Behaviors/events occurring in the distant past (defined as more than approximately a week prior to the current therapy session)
  - “After I spent a month in juvie in high school, I was really determined not to drink.”
- Talking about someone else’s intentions to change/not change
  - “My brother is thinking about joining AA, and I think he really needs it. That guy drinks way too much and his life is a wreck because of it.”
- Language that indicates the client is following the therapist but does not indicate agreement with the therapist
  - “Uh huh.”
  - “OK.”
- Any other client language that is neither CT nor CCT
  - “I’m going to need to leave a little early today because my daughter has soccer practice.”
  - “I’d like a tissue.”

**Counter-change talk.** *This type of client language refers to any movement away from change, or toward sustaining the target behavior. Note that “change” here is defined in reference to the target behavior. Within the context of treatment for problem drinking, for example, CCT is coded in relation to maintaining or increasing drinking behavior. Clients may express CCT on other subjects (e.g., change in a relationship, moving to a new apartment), but these are not coded unless directly related to the identified target behavior change. CCT need not have an oppositional quality nor an emotional charge. The key is that the client language favors not changing the target behavior, representing status quo or movement backward. Endorsing or expressing agreement with CCT offered by the therapist should be coded as an instance of CCT.*

*Each different CCT statement counts as one instance of CCT. For example, if a client lists several different reasons against or disadvantages of change, each one is coded as CCT (e.g., a volley that included a Desire<sup>-</sup>, Need<sup>-</sup>, and Other<sup>-</sup> would count as three CCT tallies, and a string of four Reason<sup>-</sup>’s would count as four CCT tallies).*

Some sub-categories of CCT include:

- Reason<sup>-</sup>: A statement indicating a rationale for not changing or for why change is unnecessary.
  - “Dancing wouldn’t be any fun without doing a few shots first.”
  - “The kids stress me out too much when I’m not drinking.”
  - “My grades are fine.”
- Desire<sup>-</sup>: A special type of reason, expressing the client’s unwillingness to change or wish to partake in the target behavior.
  - “If I could, I would drink every day until I’m 90.”

- “I love drinking.”
- Need<sup>-</sup>: A special type of reason stating a need not to change or to stay the same.
  - “Treatment isn’t something that I need right now.”
  - “I don’t need to quit drinking entirely.”
  - “I need to keep drinking if I want to keep these friends.”
- Ability<sup>-</sup>: A statement that client is unable or unconfident about change
  - “It’s just too hard to change my drinking after so many years.”
  - “I’m feeling pretty low on the confidence scale.”
- Commitment<sup>-</sup>: A statement that the client will not change, or an idea for how not to change/to stay the same.
  - “As soon as I get out of rehab I’m going to buy a case.”
  - “I’m not going to say that I won’t drink ever again.”
- Taking Steps<sup>-</sup>: A statement that the client is already resisting change; this represents steps taken in the recent past (within approximately the past week).
  - “I picked up another fifth over the weekend.”
  - “I quit my clean-and-sober housing today.”
- Other<sup>-</sup>: A statement that is clearly CCT but does not fit reasonably into the other categories. This includes minimization of problems and hypothetical statements about non-change.
  - “A DWI isn’t that big of deal to me.”
  - “If I were 21, I’d run out and buy a bottle of wine right now.”

*Change talk.* This type of client language refers to any movement toward change or away from the target behavior. As with CCT, “change” here is defined specifically in



reference to the target behavior. The client makes a statement that directly or indirectly shows evidence of at least one of the following categories, which have the quality of moving forward in the direction of change in the target behavior. Within the context of treatment for problem drinking, for example, CT is coded in reference to reducing or stopping drinking behavior.

Each *different* CT statement counts as one instance of CT. For example, if a client lists several different reasons for or advantages of change, each one is coded as CT. As with CCT, endorsing or expressing agreement with CT offered by the therapist should be coded as an instance of CT.

Some sub-categories of CT include:

- Reason<sup>+</sup>: A statement indicating a rationale for changing the target behavior.
  - “Quitting drinking would help me get up for work.”
  - “I hate the hangovers.”
  - “My family needs me to be home at night, not at the bar.”
- Desire<sup>+</sup>: A special type of reason stating the client’s willingness to alter the target behavior.
  - “I really want to get started with treatment.”
  - “I don’t even feel like drinking today.”
- Need<sup>+</sup>: A special type of reason stating the client’s need to change.
  - “I have to do this.”
  - “Therapy is what I need right now.”
- Ability<sup>+</sup>: A statement indicating that the client is able to change.
  - “I know that I can quit if I try hard enough.”

- “This doesn’t seem so difficult.”
- Commitment<sup>+</sup>: A statement that the client will change, or an idea for how the client could change.
  - “I’ll do whatever it takes to cut down on my drinking.”
  - “I could start by tossing out everything in the liquor cabinet.”
- Taking Steps<sup>+</sup>: A statement that the client has already begun to change; this represents steps taken in the recent past (within approximately the past week).
  - “At dinner last night I told my parents that I’m going to quit.”
  - “I’ve already cut down this week.”
- Other<sup>+</sup>: Any other statement about changing the target behavior. Includes hypothetical situations or circumstances that would convince the client to change, and problem recognition.
  - “My drinking is out of control.”
  - “If I could get my own place I’d be less likely to feel the urge to drink.”

## **Making Difficult Decisions**

Inherent in coding is the need to make difficult decisions, and often with limited time. Decision rules can be helpful in alleviating confusion and increasing inter-rater reliability. Our team identified some problematic situations that arose again and again, and created decision rules to deal with them:

- Following vs. agreeing: For “uh huh” statements, code as CT if you think that the client is agreeing with therapist-lended CT, but do not code anything if you think that the client is merely showing that (s)he is following the therapist.

- Coding in (close to) real time: Coding is supposed to be done on “the fly”. If you cannot decide whether to divide statements into two (or more) utterances, then only code the statement as one instance of CT or CCT.
- Coding a number. If the therapist asks the client to rate importance, confidence, or readiness on a scale, do not code the numerical answer as CT or CCT. However, if the client includes a qualifier for the number (e.g., “10. I know I can quit drinking if I want to.”), then code the statement as an instance of CT.
- Statements about the past in a present context: Only code past CT as CT if the client connects the past with a statement about the present. For example, if the client mentions past ability to cut down on drinking as a reason that (s)he can quit this time, code it as CT.
- Statements about other behaviors in the current context: A connection between the target behavior and other events/values must be established *explicitly* by the client in order to be coded later in the session. For example, if the client ties drinking into receiving lower grades, code subsequent statements about the importance of doing well in school as CT.
- Statements about others: Do not code client statements about *other* people when they are mentioned together (i.e., “we” or “us”); the client must be referring to him or herself specifically. However, if the client uses a statement about another person as a reason to change or not change, then code it as CT or CCT. For example, if the client cites a relative going to prison for DWI as a reason not to drink, then code it as CT, but do *not* code a statement about “none of us” having drinking-related problems as CCT.

## References

- Cicchetti, D. V. (1994). Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychological Assessment*, 6(4), 284-290.
- Miller, W. R. (2000). *Motivational Interviewing Skill Code (MISC) Coder's Manual*. Retrieved March 15, 2009, from University of New Mexico Center on Alcoholism, Substance Use, and Addictions Web site: <http://casaa.unm.edu/download/misc1.pdf>.
- Miller, W. R., Moyers, T. B., Ernst, D., & Amrhein, P. (2008). *Manual for the Motivational Interviewing Skill Code (MISC), Version 2.1*. Retrieved April 15, 2009, from University of New Mexico Center on Alcoholism, Substance Use, and Addictions Web site: <http://casaa.unm.edu/download/misc.pdf>.

**Appendix**  
Client Language EAsy Rating (CLEAR) Coding Sheet

Recording # \_\_\_\_\_

Coder \_\_\_\_\_

Categories	Tallies	Totals
<p style="text-align: center;">-</p> <p><b>Counter-Change Talk</b></p> <ul style="list-style-type: none"> <li>• Desire <i>not</i> to change</li> <li>• Ability <i>not</i> to change</li> <li>• Reason <i>not</i> to change</li> <li>• Need to <i>not</i> change</li> <li>• Commitment <i>not</i> to change</li> <li>• Taking steps <i>away from</i> change</li> </ul>		<b>CCT</b>
<p style="text-align: center;">+</p> <p><b>Change Talk</b></p> <ul style="list-style-type: none"> <li>• Desire to change</li> <li>• Ability to change</li> <li>• Reason to change</li> <li>• Need to change</li> <li>• Commitment to change</li> <li>• Taking steps <i>toward</i> change</li> </ul>		<b>CT</b>

## REFERENCES CITED

- Abar, C., Abar, B., & Turrisi, R. (2009). The impact of parental modeling and permissibility on alcohol use and experienced negative drinking consequences in college. *Addictive Behaviors*, 34, 542–547. doi: 10.1016/j.addbeh.2009.03.019
- Abar, C. C., Turrisi, R. J., & Mallett, K. A. (2014). Differential trajectories of alcohol-related behaviors across the first year of college by parenting profiles. *Psychology of Addictive Behaviors*, 28(1), 53–31. doi: 10.1037/a0032731.
- Andrews, J. A., & Westling, E. (2016). Substance use in emerging adulthood. In J. J. Arnett (Ed.). *The Oxford Handbook of Emerging Adulthood* (pp. 521-542). New York, NY: Oxford University Press.
- Apodaca, T. R., Jackson, K. M., Borsari, B., Magill, M., Longabaugh, R., Mastroleo, N. R., & Barnett, N. P. (2016). Which individual therapist behaviors elicit client change talk and sustain talk in motivational interviewing? *Journal of Substance Abuse Treatment*, 61, 60-65. doi:10.1016/j.jsat.2015.09.001.
- Arnett, J. J. (1998). Learning to stand alone: The contemporary American transition to adulthood in cultural and historical context. *Human Development*, 41, 295-315.
- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, 55(5), 469–480. doi: 10.1037/0003066X.55.5.469
- Arnett, J. J. (2005). The developmental context of substance use in emerging adulthood. *Journal of Drug Issues*, 35, 235–254.
- Arnett, J. J. (2007). Emerging adulthood: What is it, and what is it good for? *Child Development Perspectives*, 1, 68–73. doi: 10.1111/j.1750-8606.2007.00016.x.
- Arria, A. M., Caldeira, K. M., Bugbee, B. A., Vincent, K. B., & O’Grady, K. E. (2015). The academic consequences of marijuana use during college. *Psychology of Addictive Behaviors*, 29(3), 564-575. doi: 10.1037/adb0000108.
- Ashenhurst, J. R., Harden, K. P., Corbin, W. R., & Fromme, K. (2015). Trajectories of binge drinking and personality change across emerging adulthood. *Psychology of Addictive Behaviors*, 29(4), 978-991. doi: 10.1037/adb0000116.
- Baer, J. S., Rosengren, D. B., Dunn, C. W., Wells, W. A., Ogle, R. L., & Hartzler, B. (2004). An evaluation of workshop training in motivational interviewing for addiction and mental health clinicians. *Drug and Alcohol Dependence*, 73(1), 99–106.
- Barnett, E., Moyers, T. B., Sussman S., Smith, C., Rohrbach, L. A., Sun, P., & Spruijt-Metz, D. (2014). From counselor skill to decreased marijuana use: Does change talk matter? *Journal of Substance Abuse Treatment*, 46, 498–505. doi: 10.1016/j.jsat.2013.11.004.
- Barnett, E., Spruijt-Metz, D., Moyers, T. B., Smith, C., Rohrbach, L. A., Sun, P., & Sussman S. (2014). Bidirectional relationship between client and counselor

- speech: The importance of reframing. *Psychology of Addictive Behaviors*, 28(4), 1212–1219. doi: 10.1037/a0036227.
- Barry, A. E., Kind, J., Sears, C., Harville, C., Bondoc, I., & Joseph, K. (2016). Prioritizing alcohol prevention: Establishing alcohol as the gateway drug and linking age of first drink with illicit drug use. *Journal of School Health*, 86(1), 31–38.
- Borsari, B., & Carey, K. B. (2001). Peer influences on college drinking: A review of the research. *Journal of Substance Abuse*, 13, 391–424.
- Bowers, J. R., Segrin, C., & Joyce, N. (2016). The role of transitional instability, psychological distress, and dysfunctional drinking in emerging adults' involvement in risky sex. *Journal of Social and Personal Relationships*, 33(8), 1097–1119. doi: 10.1177/0265407515617621.
- Branscum, P., & Sharma, M. (2010). A review of motivational interviewing-based interventions targeting problematic drinking among college students. *Alcoholism Treatment Quarterly*, 28(1), 63–77. doi: 10.1080/07347320903436276
- Bronfenbrenner, U. (1989). Ecological systems theory. *Annals of Child Development*, 6, 187–249.
- Caruther, A. S., Van Ryzin, M. J., & Dishion, T. J. (2014). Preventing high-risk sexual behavior in early adulthood with family interventions in adolescence: Outcomes and developmental processes. *Prevention Science*, 15(1), S59–S69. doi: 10.1007/s11121-013-0383-9.
- CDC. Sexually Transmitted Disease Surveillance 2015. Atlanta, GA: U.S. Department of Health and Human Services; 2015.
- Chiapa, A., Smith, J. D., Kim, H., Dishion, T. J., Shaw, D. S., & Wilson, M. N. (2015). The trajectory of fidelity in a multiyear trial of the Family Check-Up predicts change in child problem behavior. *Journal of Consulting and Clinical Psychology*, 83(5), 1005–1011. doi: 10.1037/ccp0000034.
- Child and Family Center. (2001). *Teen Interview (CINT)*. Unpublished instrument, Child and Family Center, University of Oregon, Eugene, OR.
- Cicchetti, D. V., & Sparrow, S. A. (1981). Developing criteria for establishing interrater reliability of specific items: Applications to assessment of adaptive behavior. *American Journal of Mental Deficiency*, 86(2), 127–137.
- Civic, D. (1999). The association between characteristics of dating relationships and condom use among heterosexual young adults. *AIDS Education and Prevention*, 11(4), 343–352.
- Cohen, J. (1992). Statistical power analysis. *Current Directions in Psychological Science*, 1(3), 98–101. doi: 10.1111/1467-8721.ep10768783.
- Cohn, A. M., Johnson, A. L., Rath, J. M., & Villanti, A. C. (2016). Patterns of the co-use of alcohol, marijuana, and emerging tobacco products in a national sample of young adults. *The American Journal on Addictions*, 25, 634–640. doi:

- 10.1111/ajad.12456.
- Copeland, L., McNamara, R., Keslon, M., & Simpson, S. (2015). Mechanisms of change within motivational interviewing in relation to health behavior outcomes: A systematic review. *Patient Education and Counseling*, 98, 401-411. doi: 10.1016/j.pec.2014.11.022.
- Cushing, C. C., Jenson, C. D., Miller, M. B., & Leffingwell, T. R. (2014). Meta-analysis of motivational interviewing for adolescent health behavior: Efficacy beyond substance use. *Journal of Consulting and Clinical Psychology*, 82(6), 1212-1218. doi: 10.1037/a0036912.
- D'Amico, E. J., Houck, J. M., Hunter, S. B., Miles, J. N. V., Osilla, K. C., & Ewing, B. A. (2015). Group motivational interviewing for adolescents: Change talk and alcohol and marijuana outcomes. *Journal of Consulting and Clinical Psychology*, 83(1), 68–80. doi: 10.1037/a0038155
- Davey, A. & Savla, J. (2009). Estimating statistical power with incomplete data. *Organizational Research Methods*, 12(2), 320–346. doi: 10.1177/1094428107300366
- Dishion, T. J., & Stormshak, E. A. (2007). *Intervening in children's lives: An ecological, family-centered approach to mental health care*. Washington, DC: American Psychological Association.
- Dishion, T. J., Shaw, D. S., Connell, A., Gardner, F. E. M., Weaver, C., & Wilson, M. (2008). The Family Check-Up with high-risk indigent families: Preventing problem behavior by increasing parents' positive behavior support in early childhood. *Child Development*, 79, 1395–1414. doi:10.1111/j.1467-8624.2008.01195.x.
- Dishion, T. J., & Stormshak, E. A. (2009). A school-based, family-centered intervention to prevent substance use: The Family Check-Up. *The American Journal of Drug and Alcohol Abuse*, 35, 227–232. doi: 10.1080/00952990903005908.
- Dobber, J., van Meijel, B., Barkhof, E., Scholte op Reimer, W., Latour, C., Peters, R., Linszen, D. (2015). Selecting an optimal instrument to identify active ingredients of the motivational interviewing-process. *Journal of Psychosomatic Research*, 78, 268-276. doi: 10.1016/j.jpsychores.2014.10.010.
- Feldstein Ewing, S. W., Gaume, J., Ernst, D. B., Rivera, L., & Houck, J. M. (2015). Do therapist behaviors differ with Hispanic youth? A brief look at within-session therapist behaviors and youth treatment response. *Psychology of Addictive Behaviors*, 29(3), 779-786. doi: 10.1037/adb0000079.
- Fosco, G. M., Frank, J. L., Stormshak, E. A., & Dishion, T. J. (2013). Opening the “Black Box”: Family check-up intervention effects on self-regulation that prevents growth in problem behavior and substance use. *Journal of School Psychology*, 51, 455–468. doi: 10.1016/j.jsp.2013.02.001



- Gance-Cleveland, B. (2005). Motivational interviewing as a strategy to increase families' adherence to treatment regimens. *Journal for Specialists in Pediatric Nursing*, 10(3), 151–155. doi: 10.1111/j.1744-6155.2005.00028.x.
- Gardner, W., Mulvey, E. P., & Shaw, E. C. (1995). Regression analyses of counts and rates: Poisson, over dispersed Poisson, and negative binomial models. *Psychological Bulletin*, 118(3), 392-404. Doi: 10.1037/0033-2909.118.3.392.
- Glynn, L. H., & Moyer, T. B. (2012). *Manual for the Client Language EAsy Rating (CLEAR) Coding System: Formerly "Motivational Interviewing Skill Code (MISC) 1.1."* Retrieved August, 2015 from <http://casaa.unm.edu/codinginst.html>.
- Goodman, I., Peterson-Badali, M., & Henderson J. (2011). Understanding motivation for substance use treatment: The role of social pressure during the transition to adulthood. *Addictive Behaviors*, 36(6), 660-668. doi: 10.1016/j.addbeh.2011.01.011.
- Grello, C. M., Welsh, D. P., & Harper, M. S. (2006). No strings attached: The nature of casual sex in college students. *The Journal of Sex Research*, 43(3), 255-267.
- Harrell, F. (2015). *Regression Modeling Strategies: With Applications to Linear Models, Logistic and Ordinal Regression, and Survival Analysis* (2<sup>nd</sup> ed.). Nashville, TN: Springer International Publishing. doi: 10.1007/978-3-319-19425-7.
- Hendrickson, S. M. L., Martin, T., Manuel, J. K., Christopher, P. J., Thiedeman, T., & Moyers, T. B. (2004). Assessing reliability of the Motivational Interviewing Treatment Integrity behavioral coding system under limited range. *Alcoholism: Clinical and Experimental Research*, 28(5), 74A.
- Hettema, J., Steele, J., & Miller, W. (2005). Motivational interviewing. *Annual Review of Clinical Psychology*, 1, 91–111. doi:10.1146/annurev.clinpsy.1.102803.143833.
- Houck, J. M. & Moyers, T. B. (2015). Within-session communication patterns predict alcohol treatment outcomes. *Drug and Alcohol Dependence*, 157, 205-209. doi: 10.1016/j.drugalcdep.2015.10.025.
- Huh, J., Huang, Z., Liao, Y., Pentz, M., & Chou, C-P. (2013). Transitional life events and trajectories of cigarette and alcohol use during emerging adulthood: Latent class analysis and growth mixture modeling. *Journal on Studies of Alcohol and Drugs*, 74(5), 272–235.
- Knight, J. R., Wechsler, H., Kuo, M., Seibring, M., Weitzman, E. R., & Schuckit, M. A. (2002). Alcohol abuse and dependence among U.S. college students. *Journal of Studies on Alcohol*, 63(3), 263-270. doi: 10.15288/jsa.2002.63.263.
- Lowry, J. L., & Ross, M. J. (1997). Expectations of psychotherapy duration: How long should psychotherapy last? *Psychotherapy*, 34(3). 272-277.
- Lundahl, B., Moleni, T., Burke, B. L., Butters, R., Tollefson, D., Butler, C., & Rollnick, S. (2013). Motivational interviewing in medical care settings: A systematic review and meta-analysis of randomized controlled trials. *Patient Education and Counseling*, 93, 157–168. doi:10.1016/j.pec.2013.07.012.

- Magill, M., Gaume, J., Apodaca, T. R., Walthers, J., Mastroleo, N. R., Borsari, B., & Longabaugh, R. (2014). The technical hypothesis of motivational interviewing: A meta-analysis of MI's key causal model. *Journal of Consulting and Clinical Psychology*, 82(6), 973-983. doi: 10.1037/a0036833.
- Mariani, J. J., Brooks, D., Haney, M., & Levin, F. R. (2011). Quantification and comparison of marijuana smoking practices: Blunts, joints, and pipes. *Drug and Alcohol Dependence*, 113(2-3). doi: 10.1016/j.drugalcdep.2010.08.008.
- Mashhoon, Y., Czerkawski, C., Crowley, D. J., Cohen-Gilbert, J. E., Sneider, J. T., & Silveri, M. M. (2014). Binge alcohol consumption in emerging adults: Anterior cingulate cortical 'thinness' associated with alcohol use patterns. *Alcoholism: Clinical and Experimental Research*, 38(7), 1955-1964. doi: 10.1111/acer.12475.
- McCambridge, J., Slym, R. L., & Strang, J. (2008). Randomized controlled trial of motivational interviewing compared with drug information and advice for early intervention among young cannabis users. *Addiction*, 103, 1809-1818. doi:10.1111/j.1360-0443.2008.02331.x.
- Miech, R. A., Johnston, L. D., & O'Malley, P. M. (2015). Bachman J. G., Schulenberg, J. E. Monitoring the Future National Survey Results on Drug Use 1975-2014. *Ann Arbor, Institute for Social Research, The University of Michigan*.
- Miller, W. R., Moyers, T. B., Ernst, D., & Amrhein, P. (2003). *Manual for the Motivational Interviewing Skill Code (MISC) v. 2.0*. Retrieved March, 2015 from [www.motivationalinterviewing.org/library](http://www.motivationalinterviewing.org/library).
- Miller, W. R., Moyers, T. B., Ernst, D., & Amrhein, P. (2008). *Manual for the Motivational Interviewing Skill Code (MISC) v. 2.1*. Retrieved March 2015 from [www.casaa.unm.edu](http://www.casaa.unm.edu).
- Miller, W. R., & Rollnick, S. (2002). *Motivational interviewing: Preparing people for change* (2<sup>nd</sup> ed.). New York: Guilford Press.
- Miller, W. R., & Rollnick, S. (2013). *Motivational interviewing: Helping people change* (3<sup>rd</sup> ed.). New York: Guilford Press.
- Miller, W. R., & Sanchez, V. C. (1994). Motivating young adults for treatment and lifestyle change. In G. S. Nathan & P. E. Nathan (Eds.), *Alcohol use and misuse by young adults* (pp. 55-81). Notre Dame, IN: University of Notre Dame Press.
- Miller, W. R., Sovereign, R. G., & Kreege, B. (1988). Motivational interviewing with problem drinkers: II. The Drinker's Check-up as a preventive intervention. *Behavioural Psychotherapy*, 16(4), 251-268. doi: S0141347300014129.
- Mistler, L. A., Sheidow, A. J., & Davis, M. (2015). Transdiagnostic motivational enhancement therapy to reduce treatment attrition: Use in emerging adults. *Cognitive and Behavioral Practice*, Volume Null, Pagination not specified. doi: 10.1016/j.cbpra.2015.09.007.
- Moyers, T. B., & Houck, J. (2011). Combining motivational interviewing with cognitive-behavioral treatments for substance abuse: Lessons from the COMBINE research

- project. *Cognitive and Behavioral Practice*, 18, 38-45. doi: 1077-7229/10/38-45\$1.00/0.
- Moyer, T. B., Manuel, J. K., & Ernst, D. (2014). *Motivational Interviewing Treatment Integrity Coding Manual 4.1*. Unpublished Manual. Retrieved August, 2015 from <http://casaa.unm.edu/codinginst.html>.
- Moyers, T. B., Martin, T., Manuel, J. K., Hendrickson, S. M. L., & Miller, W. R. (2005). Assessing competence in the use of motivational interviewing. *Journal of Substance Abuse Treatment*, 28, 19-26. doi:10.1016/j.jsat.2004.11.001.
- Moyers, T. B. & Martin, T. (2006). Therapist influence on client language during motivational interviewing sessions. *Journal of Substance Abuse Treatment*, 30, 245–251. doi:10.1016/j.jsat.2005.12.003
- Moyers, T. B., Martin, T., Catley, D., Harris, K. J., & Ahluwalia, J. S. (2003). Assessing the integrity of motivational interventions: Reliability of the Motivational Interviewing Skills Code. *Behavioral and Cognitive Psychotherapy*, 31(2), 177–187. doi: S1352465803002054
- Moyers, T. B., Martin, T., Houck, J. M., Christopher, P. J., & Tonigan, J. S. (2009). From in-session behaviors to drinking outcomes: A causal chain for motivational interviewing. *Journal of Consulting and Clinical Psychology*, 77(6), 1113–1124. doi: 10.1037/a0017189
- Moyers, T. B., Martin, T., Manuel, J. K., Hendrickson, S. M., & Miller, W. R. (2005). Assessing competence in the use of motivational interviewing. *Journal of Substance Abuse Treatment*, 28(1), 19–26. doi: 10.1016/j.jsat.2004.11.001.
- Moyers, T. B., Rowell, L. N., Manuel, J. K., Ernst, D., & Houck, J. M. (2016). The Motivational Interviewing Treatment Integrity Code (MITI 4): Rationale, preliminary reliability and validity. *Journal of Substance Abuse Treatment*, 65, 36-42. doi: 10.1016/j.jsat.2016.01.001.
- Nelson, L. J., Padilla-Walker, L. M., Christensen, K. J., Evans, C. A., & Carroll, J. S. (2011). Parenting in emerging adulthood: An examination of parenting clusters and correlates. *Journal of Youth and Adolescence*, 40, 730–743. doi: 10.1007/s10964-010-9584-8.
- Norcross, J. C., & Wampold, B. E. (2011). Evidence-based therapy relationships: Research conclusions and clinical practices. *Psychotherapy*, 48(1), 98-102. doi: 10.1037/a0022161.
- O’Sullivan, L. F., Udell, W., Montrose, V. A., Antoniello, P. & Hoffman, S. (2010). A cognitive analysis of college students’ explanations for engaging in unprotected sexual intercourse. *Archives of Sexual Behavior*, 39(5), 1121-1131. doi: 10.1007/s10508-009-9493-7.
- Rässler, S., Rubin, D. B., & Schenker, N. (2008). Incomplete data: Diagnosis, imputation, and estimation. In E. D. de Leeuw, J. L. Hox, & D. A. Dillman (Eds.). *International Handbook of Survey Methodology* (pp. 370–386. New York, NY: Taylor & Francis Group/Lawrence Erlbaum Associates.

- Ryan, S. M., Jorm, A. F., & Lubman, D. I. (2010). Parenting factors associated with reduced adolescent alcohol use: A systematic review of longitudinal studies. *Australian and New Zealand Journal of Psychiatry*, 44 (9), 774-783. doi: 10.1080/00048674.2010.501759.
- Satterwhite, C. L., Torrone, E., Meites, E., Dunne, E. F., Mahajan, R., Bañez Ocfemia, M. C., Su, J., Xu, F., & Weinstock, H. (2013). Sexually transmitted infections among U.S. women and men: Prevalence and incidence estimates, 2008. *Sexually Transmitted Diseases*, 40(3), 187-193. doi: 184.171.106.7.
- Schulenberg, J. E., Bryan, A. L., & O'Malley, P. M. (2004). Taking hold of some kind of life: How developmental tasks relate to trajectories of well-being during the transition to adulthood. *Development and Psychopathology*, 16(4), 1119-1140. doi: 10.1017/S0954579404040167.
- Seng, E. K., & Lovejoy, T. I. (2013). Reliability and validity of a treatment fidelity assessment for motivational interviewing targeting sexual risk behaviors in people living with HIV/AIDS. *Journal of Clinical Psychology in Medical Settings*, 20, 440-448. doi: 10.1007/s10880-012-9343-y.
- Silveri, M. M. (2012). Adolescent brain development and underage drinking in the United States: identifying risks of alcohol use in college populations. *Harvard review of psychiatry*, 20(4), 189-200. doi: 10.3109/10673229.2012.714642.
- Skehan, B., & Davis, M. (2017). Aligning mental health treatment with the developmental stage and needs of late adolescents and young adults. *Child and Adolescent Psychiatric Clinics of North America*, 26 (2), 177-190. doi: 10.1016/j.chc.2016.12.003.
- Skidmore, C. R., Kaufman, E. A., & Crowell, S. E. (2016). Substance use among college students. *Child and Adolescent Psychiatric Clinics of North America*, 25(4), 735-753. doi: 10.1016/j.chc.2016.06.004.
- Skinner, H. A., & Allen, B. A. (1982). Alcohol dependence syndrome: Measurement and validation. *Journal of Abnormal Psychology*, 91(3), 199-209. doi: 10.1037/0021-843X.91.3.199.
- Smith, J. D., Dishion, T. J., Moore, K. J., Shaw, D. S., & Wilson, M. N. (2013a). Effects of video feedback on early coercive parent-child interactions: The intervening role of caregivers' relational schemas. *Journal of Clinical Child and Adolescent Psychology*, 42(3), 405-417. doi: 10.1080/15374416.2013.777917.
- Smith, J. D., Dishion, T. J., Shaw, D. S. & Wilson, M. N. (2013b). Indirect effects of fidelity to the family check-up on changes in parenting and early childhood problem behaviors. *Journal of Consulting and Clinical Psychology*, 81(6), 962–974. doi: 10.1037/a0033950.
- Smith, S. C., Schetzina, K. E., Polaha, J., Baker, K., & Wood, D. (2016). The family check-up in a pediatric clinic: An integrated care delivery model to improve behaviors in the home environment. *International Journal of Health and Human Development*, 9(4), 545-552.

- Stinson, F. S., Ruan, W. J., Pickering, R., & Grant, B. F. (2006). Cannabis use disorders in the USA: prevalence, correlates and co-morbidity. *Psychological Medicine*, 36(10), 1447-1460. doi: 10.1017/S0033291706008361.
- Stormshak, E. A., Fosco, G. M., & Dishion, T. J. (2010). Implementing interventions with families in schools to increase youth school engagement: The family check-up model. *School Mental Health*, 2(2), 82–92. doi: 10.1007/s12310-009-9025-6
- Stormshak, E. A., Connell, A. M., Véronneau, M-H., Myers, M. W., Dishion, T. J., Kavanagh, K., & Caruther, A. S. (2011). An ecological approach to promoting early adolescent mental health and social adaptation: Family-centered intervention in public middle schools. *Child Development*, 82(1), 209–225. doi: 10.1111/j.1467-8624.2010.01551.x.
- Stormshak, E., DeGarmo, D., Chronister, K., & Caruther, A. (In Preparation). Substance Abuse and Mental Health Services Administration. Results from the 2010 National Survey on Drug Use and Health: Summary of National Findings. Rockville, MD: 2011. NSDUH Series H-41 HHS Publication No. (SMA) 11–4658.
- Sussman, S., Sun, P., Rohrbach, L. A., & Spruijitt-Metz, D. (2012). One-year outcomes of a drug abuse prevention program for older teens and emerging adults: Evaluating a motivational interviewing booster component. *Health Psychology*, 31(4), 476–485. doi: 10.1037/a0025756.
- The American College Health Association. (2009). American College Health Association-National College Health Assessment Spring 2008 Reference Group Data Report (Abridged). *Journal of American College Health*, 57(5). 477-488.
- Tucker, J. S., D’Amico, E. J., Ewing, B. A., Miles, J. N. V., & Pederson, E. R. (2017). A group-based motivational interviewing brief intervention to reduce substance use and sexual risk behavior among homeless young adults. *Journal of Substance Abuse Treatment*, 76, 20-27. doi: 10.1016/j.jsat.2017.02.008.
- White, H. R., McMorris, B. J., Catalano, R. F., Fleming, C. B., Haggerty, K. P., & Abbott, R. D. (2006). Increases in alcohol and marijuana use during the transition out of high school into emerging adulthood: The effects of leaving home, going to college, and high school protective factors. *Journal of Studies on Alcohol*, 67 (6), 810-822.
- Wu, L-T., Pilowsky, D. J., Schlenger, W. E., & Hasin, D. (2007). Alcohol use disorders and the use of treatment services among college age young adults. *Psychiatric Services*, 58(2), 192–200.